

THE
ALCOHOLIC CONTROVERSY:
A REVIEW

OF THE

Westminster Review

ON

"THE PHYSIOLOGICAL ERRORS OF TEETOTALISM."

BY

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P R E F A C E.

THE article I am about to review derives a special importance from the fact, that the reasoning of the author not only appears to be conclusive with himself, but satisfactory to many others, some of whom profess to be "as much in favor of temperance as any body." I notice, too, that a number of our popular and widely circulated newspapers have indorsed the argument advanced as being "clear, cogent, and conclusive;" and some of these papers seem to rejoice exceedingly, as does the whole rum-loving and rum-selling fraternity, that a champion has come forth, armed with the panoply of science, to demonstrate physiologically that Alcohol is not only good medicine and useful drink, but also very excellent victuals.

And I have noticed with great yet painful interest that, in all the attempts which the temperance journals have made to answer the arguments of the Westminster Review, the writers have *admitted the very error* on which rests all the strength of the argument against teetotalism. They have each and all, as far as I have observed, admitted that Alcohol does in some way *impart or supply force* to the organism—an admission, it seems to me, fatal to their side of the controversy, and which gives their opponent all the advantage he can desire. It is to set the temperance people right on this point more especially that I undertake the task of reviewing the whole article.

I hope the reader will examine the article carefully. It embodies all the principles which are to settle this vital question one way or the other. It is replete either with great truths or egregious blunders, and it becomes the intelligent advocate of temperance to be able to discriminate one from the other.

After he has done this, I ask his candid attention to what I have to say in reply.

R. T. T.

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INTRODUCTION.

AN able, elaborate, and very ingenious article appeared in the Westminster Review for July, 1855, entitled, "The Physiological Errors of Teetotalism." The article is professedly an examination of Dr. Carpenter's Prize Essay on Temperance, and of a German work, *Lehre der Nahmugsmittel*, but is substantially an attempt to prove that the war now waging against intoxicating beverages, by the friends of humanity, is unjust; that Alcohol is not *essentially* poisonous to the human constitution; that it is actually a food, and as such is capable of supporting the organism, etc.

These positions the writer has fortified with authorities drawn from the standard and approved authors on Chemistry, Physiology, and Medicine.

I regard the main question involved in this discussion as vital to the temperance cause. The whole philosophy of the temperance reformation; the fundamental principle of the Maine Law; the intrinsic merit of total abstinence; and the right or wrong of statutes, pains, and penalties prohibiting the traffic in intoxicating drinks, all depend on the solution of this primary question: "Is Alcohol *essentially* poisonous?"

I entirely agree with the talented author, whose positions I am about to controvert, that, "teetotalism rests wholly and solely on these two pillars: 1. That Alcohol is a Poison and not a Food. 2. That whatever is true of the *excessive* use of Alcohol is true also, in proportional degree, of the *moderate* and *occasional* use."

Unless the affirmative of both of these propositions is true, I confess I can see no philosophical reason for "abstaining from all that can intoxicate;" and unless they are demonstrably true, I can see no ground to hope that the temperance principle will ever triumph.

My faith is not so much in forms and ceremonies, societies and mass meetings, restrictive statutes and prohibitory enactments, valuable as I

Importance of the Principles Involved in this Discussion.

esteem all of these instrumentalities, as in the truths of physiological science, which are but other terms for the laws of nature, and the natural expressions of the attributes of nature's God. Convince me that Alcohol is a food in any sense, and not a poison in every sense, and I will at once and forever abandon the total abstinence principle as neither practicable nor desirable. I am willing to go wherever truth may lead, in the natural, the moral, or the intellectual world. I ask nothing for the temperance reform, nor for any other reform, that is not in strict accordance with scientific data.

But believing as I do, that Alcohol is a poison essentially and always, and never a food in any sense, I have abiding and undoubting faith that total abstinence from all forms of "spirituous and malt liquors, wine and cider," will ultimately become the theory and practice of the whole family of mankind ; and in this faith I find the chief motive to labor for a consummation so devoutly to be wished.

If the theory of the Westminster Review be correct, it is high time the temperance people understood it, that they need not longer waste their energies in an unavailing and unjust struggle ; and if the converse be true, it is time the world should be put in possession of the evidences of its truth, to the end that wholesome laws "for the suppression of intemperance, pauperism, and crime" may not be defeated by the sophistications of a false philosophy, nor the misapprehensions of physiological principles, nor the misapplications of scientific data.

It is quite bad enough that, in the furtherance of the temperance cause, we have to contend with depraved instincts, perverted appetites, vitiated habits, sordid interests and selfish propensities, hireling editors, purchasable courts and misguided juries, without having to combat the fallacies of men who occupy the most exalted stations in the schools of learning. But as we have such a task before us, we must discharge the duty devolving as best we can.

PHYSIOLOGICAL ERRORS OF TEETOTALISM.

1. THE PHYSIOLOGY OF TEMPERANCE AND TOTAL ABSTINENCE. BEING AN EXAMINATION OF THE EFFECTS OF EXCESSIVE, MODERATE, AND OCCASIONAL USE OF ALCOHOLIC LIQUORS ON THE HEALTHY HUMAN SYSTEM. BY W. B. CARPENTER, M.D. LONDON: H. J. BOHN.
2. LEHRE DER NAHRUNGSMITTEL. FUR DAS. VOLK. VON JAC. MOLESCHOTT. *Zweite Auflage.* 1853.

Not many years ago a flutter was raised among the timorous, and considerable discussion at the tea-tables, by the announcement that Bread, hitherto regarded as so innocent and so excellent an aliment, contained a quantity of insidious poison. It contained Gin ; and bread-eaters were unsuspecting gin-drinkers. To remedy an evil so serious, to purify both bread and morals, a Company was started for the manufacture of a new kind of bread : a bread which, possessing all the old domestic virtues, should lose this dangerous alloy ; a bread to be eaten in any quantity without danger of intoxication. The Company advertised the new loaves. In prospectuses, eloquent with virtue and grave with chemistry, the eyes of an unsuspecting public were opened to the perils which had been so long masked by ignorance. For a while the new Company succeeded. At last, a bold and brilliant baker opened a shop immediately facing one of the new Com-

pany's establishments, and in his window he placed this announcement, emphatic with all their sources of type :

BREAD WITH THE GIN IN IT!

Either from some natal proclivity to evil, or else from energy of good sense, the British public responded to the appeal, flocked to the bold baker, and from that time to the present has continued to eat bread with the gin in it, undisturbed by any fears.

We are about to emulate that baker, and meet Teetotalism as boldly as he met the Anti-Gin Bakers. If the arguments and denunciations used by the leaders of that truly great movement, known as the Temperance Movement, have not only frightened those whose habitual excesses made the Movement a righteous thing, but have also frightened those more sensible persons who were in no need of reform, but *were* in need of Alcohol, it is just that a voice of protest should be raised, it is just that some one should boldly grapple with the alleged danger, and overthrow the bugbear. The baker had only to sell his bread *with* the gin in it, to avow it, glory in it, and ask, What then? We have a task more difficult; but at bottom our principle is the same, for we have to show that Alcohol in moderate quantities is beneficial, not pernicious; we have to show that the fears of the moderate are idle. A placard will not suffice. We must call in the aid of Logic, for we have to combat a fallacy: we must call in the aid of Science, for we have to combat a scientific error. Teetotalism—as distinguished from Temperance—rests upon two pillars, and upon only two; for all other supports are but the flying buttresses of the edifice, strengthening it while its columns are erect, but falling with the fallen dome. These two pillars are—1. That Alcohol is a Poison, and not a Food; 2. That whatever is true of the *excessive* use of Alcohol is true also in proportionate degree of the *moderate* and *occasional* use. On these the whole argument rests. To prepare the reader fully

A Scientific Man—Alcohol is Food—Use not Abuse.

for the conclusions this article will endeavor to establish, we warn him beforehand, that we may steal no march on him, it will be our task to prove the first position a scientific error, and to prove the second position a fallacy. *Alcohol is Food*; use is *not* the same as abuse.

Having thus clearly stated our purpose, let us with all possible emphasis express our sympathy with the Temperance Movement, and our recognition of its great and lasting influence. Considered as a *moral* movement, it is difficult to speak of it in terms too laudatory. And if it has, amid the rich harvest of its wheat, a large admixture of tares, if it has propagated scientific errors along with the exaggerations of rhetoric and the follies of fanaticism, we must not in these errors forget its good. Let no advocate of Temperance misconstrue the present article. We rescue a scientific question, we do not oppose the moral principles of the Movement. That Drunkenness is one of the most terrible sources of demoralization, and that Temperance, both physically and morally, is one of the cardinal virtues most needing inculcation, no reasonable being doubts. Equally indisputable is it that any movement which can effect a reform in the tendency to drunkenness deserves the heartiest support. Nor are we surprised at the exaggerations and errors which such a movement employs as instruments to effect its purpose. It is difficult otherwise to impress the mass; reason and moderation have but a poor chance with a race perversely indifferent to the reasons which do not assist their passions, and more impressible through their *terrors* than through any other avenue.* That Father Mathew has effected a great and salutary revolution, counting adherents by thousands, and those thousands partisans, is a matter of history; but that he would have achieved one thousandth part of his success had

* "To insist against drunkenness as a crime," said Johnson to Boswell, "because it debases reason, the noblest faculty of man, would be of no service to the common people; but to tell them that they may die in a fit of drunkenness, and show them how dreadful that would be, can not fail to make a deep impression."

Error Necessary!—Dangerous Progress of the Maine Law.

he confined himself, and had his disciples confined themselves, to the pure eloquence of truth, unaided by the momentum of striking error, and appalling but fallacious figures, is as certain as any conclusion on cases so hypothetical can hope to be—sad, but inevitable! It may not be cheering to confess that human nature is so constituted that all great movements need large admixture of error to achieve success; but the philosopher, recording what *is*, and not what is cheering, finds himself compelled to admit that such admixtures of error are as necessary as the admixture of inorganic matter with the organic matter of our food. Pure truth, like pure albumen, is an imperfect aliment for human beings.

Our purpose then, be it understood, is not to cast a stone of obstruction in the path of the Temperance Movement, but to argue a scientific question which has practical bearing on the conduct of individuals. So long as the Temperance advocates confine themselves to effecting a reform among the poorer classes, and erect Chapels of Ease to our lethargic Mother Church, they are doing righteous work, and may be pardoned their outbreaks of zeal, their passionate foolishness, their bitter animosity, and all the “wild and whirling words” with which they rival Methodists and Emancipationists. Such mistakes are but collateral matters, the dust which the flying wheels of the carriage raises on its path; and the bystander, covered by this dust, brushes it gently off, and bids the driver God speed. If our purpose were hostile, we could with ease fill this Article with extracts from Temperance writings and speeches which would rouse alternately the laughter and the scorn of every sensible reader. But neither laughter nor scorn will stop this Movement, in what it has of good or bad; and the only justification of polemics is the probable danger of legislative interference in some imitation of the *Maine Liquor Law*, which we see with grief and alarm making rapid progress in the United States. We see it with grief, because there is already too much legislative inter-

The Moderate Drinker—Dr. Carpenter's Prize Essay.

ference in departments beyond the legitimate sphere of government ; we see it with alarm, because it is founded on scientific errors respecting the use of Alcohol. Nevertheless, in spite of the Maine Law, we shall for the present restrict ourselves to the question of the use of Alcohol by moderate and sensible persons. The readers of this Review are obviously not the poorer classes ; very few of them are likely to be among the intemperate ; to them the Teetotal arguments are impertinent. The question we moot is not the one affecting the masses, but the one affecting the reader and his circle. The reader we address is a type of the "moderate" man : he drinks beer or wine at dinner, is not accustomed to any thing approaching intoxication, although he may occasionally take "more than is good for him"—which excess he sleeps off that night, —or pays for by a headache next morning, and hears no more of it. It will be seen that we are liberal in our definition of the moderate man. Many will pronounce it too liberal for them ; but, not to draw the lines too rigidly, we admit an occasional excess. To such a man the arguments of Tee-totalers do not apply. If positive science and daily experience warrant any decisive conclusions on this subject, they warrant the conclusion that to such a man Alcohol is beneficial.

Dr. Carpenter has written a Prize Essay on the Use and Abuse of Alcohol, and this Essay he has remodeled in the work placed at the head of the present Article. It has been widely circulated. The Temperance advocates are not a little proud of their champion ; and their pride is justifiable, for not only has Dr. Carpenter earned for himself a distinguished place among English physiological writers, and contributed to Physiology several observations and generalizations which give value to his works, and elevate them above the class of compilations ; he has also in this little Treatise produced the most striking defense of Teetotalism we have yet seen—a defense which staggered the present writer, and for a time coerced his assent, until a more exact scrutiny revealed

Dr. Carpenter's Vulnerable Points—First Erroneous Position.

the *fons et origo* of Dr. Carpenter's error. If therefore we confine our polemics to statements advanced by him, we limit the sweep of argument, shorten the demand on the reader's patience, and avoid the necessity for the pitiable exposure of nonsense advanced by champions less able. When Hector was dragged round the walls of Troy, the fate of Troy was certain. Let us find the vulnerable point in Dr. Carpenter's argument, and we need not waste blows on those who fight under his banner.

The vulnerable point, or points—for there are two—which Dr. Carpenter offers to our spear, are, first, the confused conception he entertains of what, strictly speaking, must be called Food; and second, the fallacy of arguing from abuse to use. We say *confused* conception, for there is nothing we shall advance on this point which he himself does not admit, especially in his other works; there is no fact unknown to him which we shall press into our service; it is with his own weapons he can be overthrown. We have only to disentangle the confusion, and we find him an ally.

In combating his arguments, we trust that our polemics will never overstep the limits of respect. Johnson, indeed, in a famous passage, says, "treating your adversary with respect is giving him an advantage to which he is not entitled. The greatest part of men can not judge of reasoning and are impressed by character; so that if you allow your adversary a respectable character, they will think that though you differ from him you may be in the wrong. Sir, *treating your adversary with respect is striking soft in battle.*" We have no intention of striking soft, but while hitting hard we must still retain the consciousness that we have a doughty antagonist, whom the public will respect if we do not.

The first and fundamentally erroneous position which he endeavors to prove is this: "The action of Alcohol upon the animal body in health is *essentially poisonous*; producing such a disturbance in the regular current of vital action, as, when

Alcohol and Oxygen—Dr. Carpenter's Fallacy.

a sufficient dose or succession of doses is administered, becomes fatal." There are but two words in this proposition which are not demonstrably true: the words "essentially poisonous." But on these words rests the whole weight of his arguments; and these words are demonstrably false. He endeavors to prove the proposition by showing how pure Alcohol injected in large doses into the stomach of a dog immediately killed it; and how from drinking seven pints of brandy a soldier died on the spot. Such examples prove that Alcohol will kill, but not that it is *essentially* a poison. Life-giving oxygen might as easily be proved a poison. No one ever doubted that a violent disturbance of the organic functions might cause death; no one ever doubted that overdoses of Alcohol will produce such disturbances; but such disturbances may be induced by overdoses of oxygen, overdoses of heat, and a hundred other things in themselves beneficial. The argument is valid against Intemperance: it is worthless in support of the proposition which maintains Alcohol to be *essentially* poisonous. The argument may serve the followers of a writer who claims the etymology of intoxication as a proof that Alcohol is poison; but philosophy shrugs its shoulders at such proof.*

The fallacy which misleads Dr. Carpenter and his followers, is the assumption that whatever is true of a large dose is true in a minor degree of a small dose. There are cases in which what is true of the whole is true of the part, what is true of a large quantity is true of a small quantity; but there are many

* "It is worthy of notice that the term *intoxication*, though usually restricted in this country to the effects of Alcohol and other substances which produce analogous effects, really implies the introduction of a *poison* into the system; and it is used in this larger sense by continental writers, who continually speak of 'arsenical intoxication,' 'iodine intoxication,' 'saturnine (lead) intoxication,' etc. The fact that a term which is the direct etymological equivalent of *poisoning*, should be in common use in this country, to designate the ordinary results of the ingestion of alcoholic liquors, is not without its significance; for if the classical term 'intoxication' be habitually employed as the equivalent of the Saxon 'drunkenness,' we are justified by the English meaning of that classical term, in asserting that *the condition of drunkenness, in all its stages, is one of poisoning.*"

The Argument from Excess—Ice and Steam—Fallacy of Vegetarianism.

cases in which no such proportionate gradation exists, cases where quantitative difference produces qualitative difference: as, for instance, when a certain weight will make a steel spring *bend*, and a slight increase of the weight will make it *break*: in the one case the force of cohesion is not destroyed, the spring, released from the weight, rebounds into its original shape; in the other, a slight addition altogether changes the effect, the spring breaks, and can not return to its original condition. The fallacy of Teetotalism lies in overlooking the fact, that quantitative differences can produce qualitative differences. When people say, "Oh, this is only a question of degree," they forget how frequently questions of *degree* involve questions of *kind*. Ice and steam differ only in the degree of heat; the cold of the Arctics and the heat of the Tropics are but differences of degree. Iron in a mass exposed to the air burns, but burns so slowly that we call it *rust*; the same iron in a state of extreme subdivision *ignites* when exposed to the air. Here we have only differences of degree; yet if an inflammable substance be near the ignited powder, it will also ignite, whereas the same substance might remain forever close by the rusting iron, and never be affected. If this be true in cases so simple, how much more should we expect to find it in cases so complex as those of organic processes, where minute variations ramify into vast and unforeseen results!

The argument from excess is worthless. It only meets cases of excess. Oxygen is as terrible a poison as strychnine, if in excess. Heat, so indispensable to the organism, is obliged to be reduced to moderate quantities before the organism can endure it. Light, which is the necessary stimulus to the eye, produces blindness in excess. Mutton chops have, when taken in moderation, a nutritive value which no Briton is bold enough to question, except the Briton laboring under the fallacy of Vegetarianism—a kindred fallacy with that of Teetotalism; yet mutton chops taken in excess kill

with the certainty of arsenic : for *over-nutrition* is fatal. Yet Dr. Carpenter can say :

The consequences of the *excessive* use of alcoholic liquors, as proved by the experience of the medical profession, and universally admitted by medical writers, having thus been shown to be precisely such as the study of its effects in poisonous and immediately fatal doses would lead us to anticipate, we are further justified in expecting that the habitual use of these liquors, in smaller quantities, if sufficiently prolonged, will ultimately be attended, in a large proportion of cases, by consequences prejudicial to the human system, the morbid actions thus engendered being likely to be chronic, rather than acute, in their character. And, as such morbid actions are actually found to be among the most common disorders of persons advanced in life, who have been in the habit of taking a “moderate” allowance of alcoholic liquors, there is very strong ground for regarding them as in great degree dependent upon the asserted cause ; although the long postponement of their effects may render it impossible to *demonstrate* the connection.

Why are we justified ? on what logic ? On logic which would justify us in saying : Abstain from Oxygen, for its *poisonous* character in excessive doses is a fact established by science, and the habitual use of smaller quantities will produce the same result ; avoid Heat, for excess of heat destroys the organism, and we are justified, etc., etc. ; shrink from Mutton, for excess of mutton is fatal ; nay, you must shrink from eating altogether, physicians having proved that more diseases arise from over-eating than from any other single cause, and what is true of excess is true, in a minor degree, of moderation. Do not deceive yourselves ; however the effects of moderate indulgence in oxygen, heat, and mutton may be disguised, their noxious influence is certain to tell in the long run—you die at last !

We anticipate one answer. It will be said these are *natural*, and that Alcohol is unnatural. Strictly speaking, the abstract question of Excess is not affected by the distinction of natural and unnatural ; but to meet the objection we will cite other cases. The maladies which are induced by over-study make a list scarcely less alarming than those induced

INVIGORATING EFFECTS OF ARSENIC—STIMULANT PRINCIPLE OF TEA.

by intemperance. No one can say it is *natural* for man to be

“With blinded eyesight, poring over miserable books,”

and writing successive volumes, which an ungrateful generation declines to read; and as it is proved that students ruin their health by over-study, may we not at once conclude all study, however moderate, all reading, however occasional, to be fatal in its effects; so that another Calif Omar is needed to burn all libraries, and to institute a *Maine Literature Law*, forbidding, under heavy penalties, the sale of this poisonous printing. Nay, we go even further. We seize horrible arsenic and drag it into the discussion. It is not a natural indispensable adjunct to human aliment. It is a poison, the qualities of which as a destructive agent are familiar enough. Nevertheless it is certain that even arsenic, so fatal in large doses, actually gives both to horses and men increased vigor, increased beauty, and an enviable rejuvenescence, when taken regularly in minute doses. In Styria it is an article of regular consumption. More familiar is the action of tea. Three or even four grains of theine (the stimulant principle of tea) may be taken by most persons with decided agreeable effect. Double the quantity, and the heart’s action is accelerated, the pulse becomes more rapid, tremblings come on, followed by other unpleasant symptoms, such as wandering thoughts, a species of intoxication, and troubrous visions.

We beg the reader not too lay too much stress on these illustrations, or to suppose we offer them as arguments. They are meant to illustrate a proposition which remains true even should every one of these illustrations be rejected—the proposition, namely, that the effects of excessive use of any thing are not *always* to be predicated, in a minor degree, of the moderate use. This proposition is of cardinal importance, and we have adduced illustrations merely for the purpose of getting it fully recognized. Deny the proposition, and Tee-totalism triumphs. Grant it—as it must be granted if only

Oxygen and Mutton Chops—Brandy-and-Water.

one case can be adduced—and the 'Teetotal question is thereby shifted to narrower ground, upon which we may hope for precise discussion. For observe: granting that in *some* cases whatever is true of excess is *not* true of moderation, any case in which it *is* true must depend upon intrinsic *qualities* not affected by relations of *quantity*. Oxygen is not intrinsically a deleterious stimulus, but only quantitatively so; mutton is not in itself pernicious, but only when taken in larger quantities than can be assimilated. This difference between quantitative and qualitative effects must be kept steadily in mind. Two mutton chops are means of nutrition; five, of indigestion; seven, of utter prostration. One glass of brandy-and-water creates exhilaration; three glasses, perplexed thinking with a tendency to tears; five, a picture we need not paint.* We ask whether, in the quality of one mutton chop and one glass of brandy, there are embers of an intrinsic danger which only flame out at the fifth; or which the quantitative increase brings with it a new phenomenon, one in which *difference of degree* becomes appreciable in *difference of kind*? Here, and here only, can the battle be decisively fought. The Temperance advocates boldly say that Alcohol is intrinsically a poison; a poison in large doses, a poison in small doses; a poison everywhere and always when taken by human beings, which *shows* its characteristic effects only when they flame up in abuse, although it silently exerts those effects when taken in the minutest doses.

It is something to have narrowed the question thus: to have brought it to a point which admits of precision in argument. The real point of issue has never been, What are the consequences of excess? Those consequences are too terribly familiar; the question has been and is, Can Alcohol be called intrinsically a poison? If it can, the Temperance advocates

* It may be said that the action of too many mutton chops is *mechanical*, and producing a disturbance of the functions; but if they be taken too frequently their action is *physiological*, and the disturbance is over-excitement, which resembles the disturbance produced by Alcohol.

have as much right to regard moderation in drinking to be only moderation in vice, as we have to regard moderate lying to be a minor form of mendacity. Lying is a vice, a vice qualitative, and there is not much difference, morally, between a man who lies liberally, with large indulgence, and a man who is constantly but minutely mendacious. We are thus brought round to a consideration of the scientific error so intimately connected with the logical fallacy just exposed—the error, namely, of calling Alcohol a poison. We hope to make it clear that Alcohol is not poison, but Food. Whatever air of paradox may hover round this assertion, arises from the popular ideas of Food, which are extremely vague and confused. To the popular mind it would be equally paradoxical to say iron is food, salt is food, chalk is food; the popular idea of Food being limited to substances which eaten by themselves "nourish," and allay hunger. *Nous avons changé tout cela.*

Science teaches us that Food has to be considered under three aspects: 1. It repairs the waste of tissue consequent on the wear and tear of life; 2. It furnishes fuel for Respiration, the main source of Animal Heat; and 3. Under both these heads it is the generator of force. The fact that every process of Life consumes some of the materials of our body, brings with it the necessity for continual repair. Unless food brought the materials of repair, our bodies would soon waste away. Food must, however, bring more than this. Over and above what is requisite for the rebuilding of the framework we require a surplus to be burnt as fuel, to produce the amount of animal heat indispensable to the on-going of the vital process. Thus, especially since Liebig's ideas have been circulated, it has become an established rule to class food into two distinct kinds, *Plastic*, or tissue-making, and *Respiratory*, or heat-making. And we beg the reader to remember that the daily consumption of Respiratory matter is *five times* the weight of the Plastic matter. Even those

Liebig's Classification of Food—Food is Force.

who do not altogether accept Liebig's views on this point, admit the classification as convenient for ordinary purposes. But, to use chemical language, *all* food is burned in the organism; and many writers compare the organism to a steam-engine in which coal is incessantly burning, and the motive-power of which is measured by the amount of fuel. In this comparison there is one serious imperfection: the engine does not consume its *own body* for the production of motive power, it consumes only the fuel; whereas the organism consumes its own tissues *and* the fuel which never becomes tissue: hence it is that the motive-power of an organism, its *force*, is not to be measured by the amount of tissue-making material furnished it, but by the amount of such material *and* of fuel. Let this be distinctly conceived, for its consequences are important: Food, of whatever kind, is *ultimately* translated into Force; whether it pass through the intermediate stage of tissue, or through that of fuel for the Respiratory process, its final stage is motive-power. Force is the end and aim of Food. The exertion of Force wastes the material fabric; with every thought we think, with every muscle we move, a particle of our fabric is consumed, *or* a particle of our fuel is burned. Oxygen is the great agent in this destruction of tissue and fuel, a destruction which is a culmination. Life flames into activity, and expires in the act.

Bérard, in his admirable "Cours de Physiologie,"* noticing the various definitions of Food, says, that when it is proposed to restrict the name to those substances only which after undergoing the process of digestion are capable of nourishing the body, the proposal reduces the list of aliments within an exceedingly small number. To which we add, that there are many substances indispensable as food which are nevertheless totally incapable of "nourishing," in the vulgar sense, or even of contributing to animal heat. No one would think of

* Vol. i. p. 556.

Alcohol gives Force—Carpenter's Division of Food.

nourishing a pigeon on chalk, yet the celebrated experiments of M. Chossat prove that pigeons deprived of chalk die of inanition, first suffering from a complete softening of their bones. Lehman and Liebig have abundantly shown that neither caseine alone, nor the substance of muscular fiber, the albumen of eggs or of blood, is capable of supporting the plastic or formative processes ; that neither starch, sugar, nor fat can alone sustain the process of respiration. Food, then, is a very complex thing, and not at all the simple thing commonly supposed. The only simple definition of Food is that which, looking at the aim and end of Food, pronounces it to be Force.

The reader has already outrun our conclusion, that if Food is Force and Alcohol is Force, Alcohol must necessarily be Food ; but we must restrain his quick impatience, and ask him to attend to the intermediate links of the chain of demonstration. Dr. Carpenter, whom we are combating, knows better than most people that Alcohol gives Force, but from not perceiving that Food is, strictly speaking, Force, he denies that Alcohol is Food. At least he denies it in his Prize Essay. In his "Principles of Human Physiology" he holds somewhat different language ; he is there addressing men of science, and we find him tolerably explicit. He divides Food into four groups : saccharine, oleaginous, albuminous, and gelatinous. "The saccharine group," he says, "includes all those substances derived from the Vegetable Kingdom which are analogous in their composition to sugar. To this group belong starch, gum, woody fiber, and the cellulose of plants which closely resemble each other in the proportion of their elements, and which may be converted into sugar by chemical processes of a simple kind ; while *Alcohol*, which is derived from sugar by the process of fermentation, *has a composition which rather connects it with the next group.*"* How is this Poison suddenly elevated to the rank of a food by its energetic perse-

* "Human Physiology." 4th Edit., p. 375.

Dr. Carpenter's Inconsistencies—Oxygen and Alcohol.

cutor? We leave others the explanation of the contradiction; we have only to show that in his work addressing men of science, he regards Alcohol as Food. A little farther on he truly says, "We may estimate the relative value of different articles of food for the two distinct purposes of tissue-formation and the production of heat. For the proportion of albuminous matter which any substance may contain, furnishes the measure of its tissue-forming value; while the proportion of hydro-carbon uncombined with oxygen affords the means of estimating its calorific power when oxydized." Alcohol has a large proportion of hydro-carbon thus uncombined—a proportion larger than is found in starch, cane-sugar, or grape-sugar; therefore Alcohol is better calorific food than starch or sugar, and seven times better than lean flesh; so that unless Dr. Carpenter retracts his own language, unless he withholds the name of Food from all substances not forming tissue, he is himself to be cited as maintaining that Alcohol is Food, not poison.

We have seen that Oxygen is the great vitalizing destroyer of tissue. Its voracity is irresistible. Food it must and will have. If there be no fuel in the grate, it burns the grate. "The amount of nourishment required by an animal for its support must be in a direct ratio with the quantity of oxygen taken into the system." (Liebig.) But, under the term nourishment, our readers have learned to include Alcohol, which nourishes as *fuel*. "Of all respiratory matters, Alcohol acts most rapidly," says Liebig; and in this rapidity there is great virtue, for starch, very good food in itself, requires some hours before it becomes soluble in the alimentary canal of the bread-eater, so as to enter the blood and there serve the purposes of respiration. Both starch and alcohol are burned, and in burning throw out force; but when the demand for force is urgent, the food which most rapidly creates it is the most valuable. Lehmann cautions us, in estimating the nutritive value of an aliment, not to be guided solely by its

Digestibility of Alcohol—It is a Respiratory Food.

elementary composition, but also by its digestibility, which thus becomes one factor in the sum.* Now the *digestibility* of Alcohol (so to speak) surpasses that of any other aliment; it requires less elaboration to fit it for its ultimate purpose, namely, the translation into nervous force.

“Alcohol stands high as a respiratory material. Its use enables us to dispense with starch and sugar in our food.” (Liebig.) Is more wanted to show that Alcohol is Food? Are not all physiologists agreed in considering respiratory materials as food? But we can show that Alcohol is not only food in this sense, but also in the sense of supplying the place of other kinds of food. If you don’t drink Alcohol, you must supply its place with more bread or pudding. Liebig tells us how Temperance families depriving their servants of beer, gave them compensation in money; but they soon found that the monthly consumption of bread increased so strikingly, that the beer was twice paid for—once in money and a second time in bread. The same authority relates the experience of the landlord at the Hôtel de Russe, in Frankfort, where the Peace Congress was held; the members of this Congress were mostly Teetotalers, and a regular deficiency was observed every day in certain dishes, especially farinaceous dishes, puddings, etc.; so unheard-of a deficiency in an establishment where for years the amount of dishes for a given number of persons had so well been known, excited the landlord’s astonishment.† The Teetotalers made up in pudding what they neglected in wine. Now, although the accurate physiologist will demur, perhaps, to Liebig’s conclusion, that this increase of pudding is owing to wine being a respiratory material, no one will dispute the fact of the increase being due to the absence of wine. Moleschott,‡ commenting on this passage of Liebig, points out that the “wine saves the tissues from being burned, by *offering itself as fuel*, and that is why wine enables us to dispense with

* “Lehrbuch der Physiolog. Chimie.” 2d Edit., vol. iii. p. 349

† Liebig: “Letters on Chemistry,” p. 454. ‡ “Kreislauf des Lebens,” p. 303.

Alcohol saves the Tissue—Hard Drinkers Eat but Little.

an equivalent of pudding; we eat less, because we spend less." But let the physiological reason be what it may, the fact is certain: wine replaces pudding and farinaceous food. It is, of course, a fact of double application; if wine replaces pudding, pudding will replace wine. The Temperance advocates have been copious in proving that pudding replaces wine, but they have ignored the other truth, that wine replaces pudding. Their reciprocity is an Irish reciprocity—"all on one side." Had they not ignored it, they could not have declared Alcohol to be a poison, for poisons have not the property of replacing wholesome food.

If we reflect that Alcohol is Respiratory food, and that the organism needs five times as much Respiratory food as Plastic food, we may be able to explain the notorious fact of hard drinkers scarcely taking any "food" (except their drink), and yet, in spite of this absence of "food," they manage to live on through many years, performing all their functions, not very vigorously it may be, not as highly reputable citizens, but nevertheless *living*, and upon a quantity of "food" so small that life could not be sustained a month on such a quantity, did they not call in the aid of a poison. This paradox it was incumbent on Dr. Carpenter to clear up. He has not alluded to it; indeed, it destroys his argument. He maintains Alcohol to be poison, and he denies its claim to be considered as food, because it can not supply the materials of growth and regeneration. And he says:

Now it may be accepted as an indubitable fact in Organic Chemistry, that there is not the slightest relation of composition between Alcohol and muscular tissue; and all our present knowledge of the subject tends to prove, that the albuminous matters of the blood, at the expense of which that tissue is formed, can not be *generated* within the body of man, or of any other animal, but are derived immediately from the food. We can not regard alcoholic liquors, then, as contributing to the nutrition of muscular tissue; except in so far as they may contain albuminous matters in addition to the Alcohol, which is the case to a slight degree with "malt liquors." But these matters would have the

Dr. Carpenter Controverted—A Startling Proposition.

same nutrient power, if they were taken in the form of solid food; and the proportion in which they exist in any kind of malt liquor is so small, that they may be fairly disregarded in any discussion on its nutritive value.

We can not speak with the same positiveness in regard to the *impossibility* of any assistance being afforded by Alcohol in the nutrition of the Nervous system, since Alcohol is less dissimilar in composition to the substance of Nerve than it is to that of Muscle. But there are two circumstances which render it *highly improbable* that Alcohol can ever be converted into nervous matter. In the first place, we have no other example of an organic compound being found applicable to the nutrition of the animal tissues, which is the product of incipient *decay* or decomposition; yet this is strictly the case with Alcohol; and we can scarcely imagine, therefore, that it can be an appropriate material for the *formation* of the most active and important part of the whole animal mechanism.

There seems to us in this passage a certain confusion. It limits nutrition to the tissue-forming process; and no one knows better than Dr. Carpenter the error of such a limitation. It shifts a question of force to one of tissue. The point in debate is not, whether Alcohol can be converted into Nervous *tissue* (which may or may not be the case), but whether it can be converted into Nervous *force*. Organic Chemistry may one day show that Alcohol is actually converted into nerve-tissue; which already one may suspect to be the case from its great affinity, and the selective eagerness with which it acts on that tissue. But even should this never be proved, the fact of Alcohol being converted into nerve-force, or some substitute for nerve-force, is disputed by no one. Confusion of ideas, like the one we combat, perplexes the writings of Temperance advocates. They quote with foolish triumph the assertion of Liebig, that "we can prove with mathematical certainty that as much flour or meal as can lie on the point of a table-knife is more nutritious than five measures (about eight or ten quarts?) of the best Bavarian beer." Yet when they circulate this startling proposition, they omit to add that Liebig is directly *opposed* to their doctrine, and that consequently the word "nutritious" points to a more

Nutrition of Tissue—Nutrition of Force—Moleschott.

restricted idea than that which they understand by it: it points to the nutrition of tissue, and leaves out the nutrition of force. Let any one for a moment consider the absurdity of a proposition which says a pinch of meal has greater sustaining power than a quart of beer! Let a man be hungry or weary, with scanty food and a large amount of labor to get through, and then let him try how much assistance he would receive from a pinch of meal. What assistance he gets from beer is known. It is no answer to this to say the force is *temporary*. All force is temporary.

Trusting that by this time the reader is convinced that Food is Force, and that Alcohol is Food, we will now endeavor to explain how and why it is so. Moleschott says, that it is because Alcohol saves the consumption of tissue; we think it is that, and something else. Our old illustration of a furnace may be called in, the more so because Dr. Carpenter has employed it in one of his most striking passages:

The peculiar vital activity of the nervous and muscular systems which manifests itself in sensation, motion, etc., is entirely dependent upon chemical changes in those tissues which can only be sustained by a constant supply of oxygen through the blood; and in proportion to the degree of activity which they are called upon to put forth are the quantity of oxygen that is required for consumption, and the amount of the components of those tissues that are reduced to the state of dead or effete matter. This matter is received back into the current of circulating blood that it may be conveyed to the excretory organs, by which it may be removed from the system; that part of it which can not be turned to any account whatever is at once separated by the kidneys; but by far the larger portion of it is gradually applied to the maintenance of the temperature of the body, by being subjected to the combustive process, the products of which are discharged through the lungs. Now if any cause should obstruct the perfect performance of this process of oxydation, the effete matter, instead of being removed from the blood in a fully oxydized condition nearly as fast as it enters it, is only partially got rid of; and it thus tends to accumulate in the circulating current, or is discharged in some lower form of oxydation, just as when a lamp or a furnace *smokes*, from being supplied with oxygen in an insufficient degree to effect perfect combustion. And among other evidences of this fact,

Alcohol Prevents Living Tissue from becoming Effete.

which the experience of every one will enable him to recognize, is the offensive odor which proceeds from the persons of those who have been for some time pent up in ill-ventilated apartments, and which helps, with the accumulated carbonic acid of the respiration, to contaminate the whole atmosphere. Thus, then, we may liken the living body to a manufactory, wherein various operations are going on which involve the production of matters too noxious to be kept in it; for the consumption of these a furnace is provided, which, when in full operation, burns them off as fast as they are produced, and thus gives their components back to the atmosphere in the least injurious form; and the heat which is thus generated serves to warm the manufactory. But if the access of air to the furnace be limited by partially cutting off the draught, or more of the offensive fuel be brought to it than it can thoroughly consume, then the offensive matter is either got rid of by an imperfect combustion, the products of which have not lost their noxious character, or it accumulates within the building, to the great discomfort and injury of all exposed to its effluvia.

Nothing can be clearer. He then passes to the description of Alcohol, and its readiness to combine with oxygen, which is greater than that of most other substances; and here he glides into an error: If, he says,

—while our furnace-fire is effectually doing its duty in consuming all the noxious products of our manufactory, some Alcohol be poured on the flame, *this will immediately blaze up, undergoing as rapid a combustion as the limited supply of oxygen will allow, and thus checking for a time the combustion of the offensive fuel which the fire was previously serving to consume.* Hence it will in effect produce exactly the same result, in regard to these substances, as that which would be occasioned by cutting off the draught of air, for they must remain almost or completely unconsumed so long as the Alcohol remains to set up the first claim on the limited supply of oxygen.

The mistake here is in applying too rigorously to the organism the analogy of the furnace; and, further, in assuming that the supply of oxygen must be limited. If Alcohol prevents a certain quantity of effete tissue from being burned and carried away, it also prevents a certain quantity of living tissue from *becoming* effete, so that *the balance is preserved*; and while so much tissue is saved, an equivalent amount of

Analogy of Oil on a Fire—Alcohol Burned instead of Tissue.

force has been generated by the Alcohol. There is a real analogy between pouring oil on a fire and alcohol on tissue. The oil is burned *instead* of the coal ; the alcohol is burned instead of the tissue. We do not place coal on a fire for the sole and express purpose of burning it ; we place it there for the sake of the heat evolved in its combustion. If any one can show us how to save our coal, and get the heat, we shall gratefully adopt his plan. Oil saves the coal, indeed ; but oil being more expensive than coal, no one thinks of *that* plan. It is certain that we do not desire our coal to be consumed for consumption's sake, but for heat's sake. If there be an absolute necessity that all the coal should be consumed, and the amount of oxygen which is to consume it is limited, then every drop of oil we pour on the fire is an obstruction and an offense. But there is no such necessity. We want the heat, and we burn the coal to get the heat. Every drop of oil poured on the fire saves a certain quantity of coal and produces an equivalent amount of heat. The case is similar in the organism. We want heat and force. To evolve heat we must have tissue ; to have tissue we must have food. If any one can show us how to save our tissue and get the heat, we shall only be too willing to adopt his plan ; for we are under no *other* necessity of burning our tissue than what is commanded by the need of heat. Alcohol, by its greater affinity for oxygen, protects the tissue and sacrifices itself to the voracious element. It is burned, the tissue remains just where it was before, like the coal when the oil is consumed, ready to be burned by the next rush of oxygen carried thither in the impetuous torrent of the circulation. For we must not forget that when oil is poured on the fire, and flames up into heat, the coal underneath remains unaltered and is ready the next minute to burn as if no oil had ever been on it ; so with the tissue. Thus do we prove a clear gain ; and thus do we explain why intemperate drinkers can subsist on a modicum of food : they burn alcohol instead of burning their bodies.

Alcohol Expensive, but nevertheless supplies the Place of Food.

Alcohol may be a more expensive fuel than meat, as oil is than coal ; but we are not arguing a question of expense. The point we have to settle is, Does Alcohol save tissue, and supply the place of food ?

Dr. Carpenter seems not to have directed his attention to this point, but to have confined himself to the evils resulting from effete tissue not being eliminated. He reasons thus : In the vital process tissue is disintegrated. This waste matter, the ashes of the tissues, is carried along the circulating current, and has to be got rid of or the organism will suffer. There are several modes of elimination, but the most efficient is Respiration, whereby oxygen replaces these ashes. If Alcohol be continually present in the circulating current, the oxygen will select it and neglect the ashes. True ; but for Dr. Carpenter's argument to have any value, it is necessary that the Alcohol should be *continually present*, and he knows very well that it *is not* and *can not be* continually present ; he knows that it is removed from the blood with extreme rapidity, and can only by figure of speech be said to be continually present, even in the blood of habitual sots. He knows that the torrent of the circulation takes but one minute to carry a particle of blood over the whole circuit of the body,* and that Alcohol can no more *remain* in the blood than oil can remain on ignited coals. Yet, with strange logic, he can say—

The foregoing details fully bear out our position, that *when* such a succession of doses of Alcohol is taken *as keeps the blood charged with it, notwithstanding its constant withdrawal* by the excretory operations, a disordered state of nutrition is induced in the body in general, but more particularly in the nervous systems, which, if maintained by the continual reintroduction of this substance, at last becomes fatal. It is impossible, *then*, fairly to refuse to Alcohol, *thus taken*, the character of a *slow poison* ; the injurious effects which it produces being in every respect analogous to those occasioned by the introduction of other substances which are universally recognized as such.

Certainly *when* such a surcharging of the blood takes place,

* Budge's experiments on animals prove the circle to be complete in thirty seconds.

Errors of Carpenter's Theory of the Action of Alcohol.

then, etc. If Dr. Carpenter's theory of the action of Alcohol were correct, habitual drunkards ought to have their blood entirely venous, or nearly so, and every part of their bodies crowded with the eliminated ashes of burned tissue. But the real injury of Alcohol lies not in the direction he points ; it lies in the *disturbance* of the organic processes consequent on a too greatly accelerated activity of some of them. Any violent disturbance may be fatal ; a man may walk himself to death as well as drink himself to death.

We return to our point, that Alcohol not only saves the consumption of tissue, and has a negative value, but that it has also a positive value as nutriment of force. All chemists agree that it spares the consumption of fat. Moleschott, after declaring good beer to be not more *nutritious* than fruit, wine scarcely so much as sugar and water, and brandy still less, addresses himself to the question, whether the popular idea of Alcohol being a force-producer is well-founded ? He says, although Alcohol forms none of the constituents of blood, it limits the combustion of those constituents, and in this way is the equivalent of so much blood. "He who has little can give but little if he wish to retain as much as one who is prodigal of his wealth. Alcohol is the savings-bank of the tissues. He who eats little and drinks Alcohol in moderation, retains as much in his blood and tissues as he who eats more and drinks no Alcohol."* And so convinced is Moleschott, that he says it is *grausam* to rob the laborer of that Alcohol which alone can compensate the deficiency of his food ; a position in which we can not agree, when we reflect that the money spent on Alcohol would furnish an equivalent in food, and not lead to the many evils of intemperance. Waiving this point, as beyond the present sphere of discussion, we direct attention to the fact that, although not one of the constituents of blood, Alcohol is the equivalent of blood, and burned for the same purpose. Moleschott and Liebig both

* "Lehre der Nahrungsmittel," p. 162.

Alcohol has a Positive as well as a Negative Value.

seem to content themselves with assigning to Alcohol a merely negative value in the preservation of tissue ; but we think that it is demonstrable that Alcohol has a positive value, and that this positive value is the source of its preservation of tissue : we mean, that the Alcohol which is burned instead of tissue, *evolves force* in its combustion, and this evolution of force, which is at the expense of Alcohol, is a substitute for the force which would otherwise be evolved at the expense of tissue. If in drinking a glass of brandy you save an ounce of beef, it is because the same amount of force can be evolved from the brandy as from the beef ; and it is not enough for us to say the brandy has saved so much beef, and has a negative value ; we must say, it has replaced so much beef, and has therefore a very positive value. It is not enough to say oil saves the coal on which it is poured ; it takes the place of so much coal.

We linger on this point with the more insistence because it is diametrically opposite to what Dr. Carpenter advocates. He believes that Alcohol acts as a stimulant, not as a nutriment. Thus he says :

It may be freely admitted that occasions *may* arise when it is of the utmost importance that a certain amount of exertion (bodily or mental) should be *temporarily* made to which the overtired and perhaps exhausted powers of the individual may be inadequate, and that no assistance can so effectually supply the deficient energy as that which is afforded by alcoholic liquors sparingly administered. But it is obvious, from the facts already stated, that their use affords *no real increase* to the strength, but that they merely *stimulate* the Nervous system to a greater intensity of action, which must occasion a more rapid metamorphosis of its substance, and, consequently, an earlier as well as a more prolonged failure of its powers.

The error, as we conceive it, lies in the assertion that a greater metamorphosis of the tissue takes place, and that it is this which furnishes the increase of force. We think, on the contrary, that Alcohol is nutriment as well as stimulus ; that it saves an equivalent amount of tissue instead of consuming

Alcohol actually gives Strength—It is a Nutriment.

it—just as oil saves coal—and that although the *result* of the stimulus may be a greater consumption of tissue in a given time than would have taken place without it—just as the oil blazing up in the fire will increase the temperature of the coals, and thus hasten combustion—yet it is demonstrable that real increase of strength *is* given ; that Alcohol is positive nutriment, or else it could not replace nutriment, nor could it enable drunkards to subsist. Dr. Carpenter is haunted by the two-fold error of considering Alcohol as a poison, and as non-nutritious ; hence he can not regard its influence as extending beyond that of mere stimulus. We hope our readers have had evidence enough to convince them that Alcohol is *not* a Poison, and *is* Nutriment ; and we hope they have understood our explanation why it is so.

And even if it were true that Alcohol is a poison, would it deserve all the harm said of it? When the late Charles Mathews was shown the animalcules in a drop of water, revealed by a microscope, he shuddered at the dangers to which he had been exposed, and expressed his determination to drink no more water without brandy, “for then,” said he, “if the monsters are not dead, they will be dead-drunk!” And when we read the more terrible revelations which chemists make respecting the water we once thought so innocent ; when we read of the poisons it contains, both from direct and indirect sources, we begin to marvel at the aptitude which the human organism possesses in resisting and making light of poisons. We are all in a private way descendants of Mithridates. The water we drink, the tea we drink, the medicines we take, and the pickles—especially the pickles!—we eat, are all so many poisons. Death itself is but the consummation of a system of slow poisoning. There is tea, even when unadulterated, notoriously a slow poison ; coffee, a slow poison ; tobacco, a slow poison ; carbonic acid in the air of churches, theaters, and assemblies, a slow poison ; beer, slow poison ; wine, accelerated poison ; brandy, rapid poison. And

The Stimulus of Alcohol—Nonsensical Ideas of Stimulants.

these poisons we accumulate. How do we escape their terrible effects? It is clear the organism must possess some admirable contrivance for righting itself, some method of eliminating all these poisons as fast as they present themselves. On this the Moderate man may take his stand to justify his practice, even if he elsewhere agrees with Dr. Carpenter. Our opponents overlook this principle of rectification which the organism possesses in its various methods of elimination; and, in overlooking it, they argue as if the poisonous substance, once present, must remain and exercise a poisonous effect; whereas the poisonous effect only ensues when that presence is prolonged. In a similar way pressure on a muscle will drive the blood from it, and if prolonged this pressure will cause the part to wither; but if the pressure be of short duration, the temporary disturbance is immediately rectified by a fresh flow of blood. In like manner, if Alcohol were *continually* present in the circulating current, the effect would be fatal. But it is not and can not be continually present; and its temporary presence is only a temporary disturbance, and this disturbance is a stimulus.

A stimulus! This leads us to consider another aspect of the question: the physiological influence of stimulants, and in particular of Alcohol. We must take this bull by the horns, and no longer suffer him to gore a timid public, alarmed at the very name. The nonsense many men utter respecting stimulants would be surprising if we were not hardened against surprise at nonsense. The teetotalers and hydro-pathists are especially inconsequent, for they declaim against Alcohol because it is a stimulant, and are eloquent on the virtues of tea and coffee, which are also stimulants. Green tea produces paralysis in animals, and when taken freely produces nervous tremblings, palpitations, and other distressing symptoms. Professor Johnston, alluding to the headaches and giddiness to which *tea-tasters* are subject, says that the men employed in unpacking tea-chests are very liable to at-

Organic Processes Dependent on Stimulus—All Nations use Stimulants.

tacks of paralysis.* Can Dr. Carpenter approve the use of such a stimulant as Tea, a stimulant which in large doses becomes a poison? Not surely on the resemblance of Theine with one of the supposed constituents of the tissues, Creatinine, for *that* is a product of disintegration, and is as unfit for nutrition as other products of effete tissues are;† not surely on the ground of its only being hurtful in excesses, for he argues against moderation in Alcohol because it is hurtful in excess.

Life is only possible under incessant stimulus. Organic processes depend on incessant change, and this change is dependent on stimuli. The stimulus of food, the stimulus of fresh air, the stimulus of exercise, are called natural, beneficial; the stimulus of tea and coffee is called agreeable, refreshing, and so forth; the stimulus of Alcohol seems selected for special reprobation without cause being shown, except that people choose to say it is not natural. How not natural? The phrase can have two significations, and it can have but two: first, that Alcohol is not a stimulus which man employs in a state of nature; second, it is not consonant with the nature of his organism. The second is a pure begging of the question; and the first is in flat contradiction with experience, which shows the savage only too eager for Alcohol—when he can get it, although he has not always the wit to discover it. No nation known to us has ever passed into the inventive condition of even rudimentary civilization without discovering, and, having discovered, without largely indulging in, the stimulus of Alcohol. Man discovers fermentation as he discovers the tea-plant and the coffee-plant.‡

Of two things, one: either we must condemn *all* stimulus

* "Chemistry of Common Life," vol. i. p. 170.

† Moeschott, "Kreislauf," p. 306. Robin et Verdeil, "Chimie Anatomique," vol. ii. p. 489, *et seq.*; and Lehmann, "Lehrbuch," vol. ii. p. 251, *et seq.* (2d Edition.) These writers all reject Liebig's idea of Creatine and Creatinine as organic principles.

‡ Liebig has a good passage on this subject: "Leiters on Chemistry," p. 456.

Peculiarity of Aleoholic Stimulus—Tommy and the Razor.

and Alcohol, because it is a stimulus, or we must prove that there is something peculiar in the alcoholic stimulus which demarcates it from all others. Here, again, the reader sees the question narrowed, and brought within an arena of precise debate. Only two positions are possible ; indeed, we may say only one ; for who is mad enough to condemn all stimulus ? The ground thus cleared, the fight narrowed to this one point, let us do justice to the strength of our antagonist ; let us confess at once that there *is* a peculiarity in Alcohol which justifies in some degree its bad reputation, a peculiarity upon which all the mischief of intoxication depends, one which causes all the miseries so feelingly laid to its door. And what is this peculiarity ? Nothing less than the fascination of its virtue, the potency of its effect ! Were it less alluring, it would not lure to excess ; were it less potent, it would not leap into such flames of fiery exaltation. In its virtue lies its crime. Smirch the lovely face of Helen, and neither Greeks nor Trojans will fight ten minutes for her in whose cause ten years of fighting seemed nothing. Not in disparagement of fiery Alcohol, whom we are fighting to defend, do we confess the fatal gift of fascination which makes dalliance with her dangerous ; not in disparagement, but in candor, and in the hope that our candor will be reciprocated. For if we admit the danger, do we not imply the charm ? Razors are dangerous instruments, and we carefully place them out of Master Tommy's reach ; but it is the excellence of the razors which induces the precaution ; were they not sharp, they would not cause us a moment's anxiety. In a similar spirit we applaud the means taken by Temperance advocates to remove this potent Alcohol out of the reach of men who are but as children in self-command. But while we frighten Tommy with a rehearsal of the terrible consequences which may ensue if he venture to touch the razor, and frighten the mob of larger Tommies by depicting the limbo of horror where dwells the terrible Spirit, we cease the precaution when our juvenile

Dangers of Alcohol—Large and Small Quantities.

friend, emerging from jackets to the dignity of shaving, begins to feel the necessity for a more efficient instrument than the tongue of that mythical "Tom-cat," facetiously offered to the beards of youngsters; the razor is then placed in his hands with full reliance that he will not cut himself—often.

The dangers of Alcohol come not properly within the scope of the present argument. We have to exemplify its uses, not only directly as Food, but indirectly as Stimulus. "The first effects," Dr. Carpenter tells us, "are in most persons an increase in the force and rapidity of the heart's contractions, producing a full, frequent, and strong pulse. With this there seems to be *a general exaltation of the organic functions*, the appetite and the digestive power being increased, and the secretions augmented, especially those of the skin and kidneys." He continues to describe the effects of an increased dose; but here the "moderate" man has no need to follow him, for the moderate are contented with these first effects; and in considering what Dr. Carpenter has himself admitted respecting the effect of a small dose, we may express some surprise at his failing to recognize the beneficial agency of a stimulus which is so very analogous to the stimulus of a sharp mountain-walk. He will tell us that this exaltation of the organic processes is only *temporary*. To which we answer: only a temporary exaltation is needed; if it were prolonged, it would be pernicious. He will tell us that the excitement is followed by a depression. This is no more than saying that our mountain-walk will be followed by fatigue. If large quantities of spirit be taken, the excitement will be great, the depression great; if small quantities, the excitement will be moderate, the depression moderate; and so on, in proportion. If our mountain-walk extend over many hours, the fatigue will be great; if only a few hours, the fatigue will be moderate; if one or two hours, the fatigue will scarcely be appreciable. Dr. Carpenter, always passing rapidly over the important

Alcoholic Stimulus not Injurious—Too Much of Any Thing Bad.

point of moderation in his eagerness to show the danger of excess, says :

A small quantity of alcoholic liquor, diluted by the fluids already in the stomach, appears to produce only a quickening of the circulation, and a temporary exaltation of the functional activity of the organ, as shown in the increase of appetite and of digestive power. But when a larger quantity is introduced, and especially *when successive doses are taken*, so as to keep up the irritation, or when the Alcohol is in a state of high concentration, and the stomach contains but little other fluid, all the effects of an irritant are produced, varying from moderate congestion with diminished functional activity, to intense congestion passing into inflammation, and even to a gangrenous state.

But we, who are only arguing for moderate doses, reject as inapplicable his counter-statements about excessive doses. What we want to prove is, that the stimulus is not *in itself* injurious but beneficial. Too much of it we know to be injurious. Too much of anything is—too much. On this point let Professor Johnston be heard.* Ardent spirits, he says, contain none of the common forms of nutritive matter which exist in our usual varieties of animal and vegetable food ; but it by no means follows that they are incapable of serving any useful purpose in the animal economy. “On the contrary,” he says, “it is ascertained of ardent spirits—

First, That they directly warm the body, and, by the changes they undergo in the blood, supply a portion of that carbonic acid and watery vapor which, as a necessity of life, are constantly being given off by the lungs. They so far, therefore, supply the place of food—of the fat and starch for example—which we usually eat. Hence a schnapps, in Germany, with a slice of lean dried meat, make a mixture like that of the starch and gluten in our bread, which is capable of feeding the body. So we either add sugar to milk, or take spirits along with it (old man’s milk), for the purpose of adjusting the proportions of the ingredients more suitably to the constitution, or to the circumstances in which it is to be consumed.

Second, That they diminish the absolute amount of matter usually given off by the lungs and the kidneys. They thus lessen, as tea and coffee do, the natural waste of the fat and tissues, and they necessarily

* “ Chemistry of Common Life,” vol. i. p. 849.

diminish, in an equal degree, the quantity of ordinary food which is necessary to keep up the weight of the body. In other words, they have the property of making a given weight of food go further in sustaining the strength and bulk of the body. And in addition to the saving of material thus effected, they ease and lighten the labor of the digestive organs, which, when the stomach is weak, is often a most valuable result.

Hence fermented liquors, if otherwise suitable to the constitution, exercise a beneficial influence upon old people, and other weakly persons whose fat and tissues have begun to waste—in whom the process of digestion, that is, does not replace the tissues as fast as they naturally waste. This lessening in weight or substance is one of the most usual consequences of the approach of old age. It is a common symptom of the decline of life. The stomach either does not receive or does not digest food enough to replace that which is daily removed from the substance of the body. Weak alcoholic drinks arrest or retard, and thus diminish the daily amount of this loss of substance. They gently stimulate the digestive organs also, and help them to do their work more fully and faithfully; and thus the body is sustained to a later period in life. Hence poets have called wine “the milk of the old,” and scientific philosophy owns the propriety of the term. If it does not nourish the old so directly as milk nourishes the young, yet it certainly does aid in supporting and filling up their failing frames. And it is one of the happy consequences of a temperate youth and manhood, that this spirituous milk does not fail in its good effects when the weight of years begins to press upon us.

Nor is Liebig less explicit; and we cite him the more willingly because, besides his high scientific reputation, he ought to be heard in this case from the use Teetotalers have made of some of his statements :

As a restorative, a means of refreshment where the powers of life are exhausted, of giving animation and energy where man has to struggle with days of sorrow, as a means of *collection and compensation where misproportion occurs in nutrition*, and the organism is deranged in its operations, and as a means of protection against transient organic disturbances, *wine is surpassed by no product of nature or of art*. The nobler wines of the Rhine, and many of those of Bordeaux, are distinguished above all others by producing a minimum of injurious after-effect. The quantity of wine consumed on the Rhine by persons of all ages, without perceptible injury to their mental and bodily health, is hardly credible. Gout and calculous diseases are nowhere more rare

 Wine a Universal Medicine—The Milk for the Aged.

than in the district of the Rhinegau. *In no part of Germany do the apothecaries' establishments bring so low a price as in the rich cities on the Rhine; for there wine is the universal medicine of the healthy as well as the sick. It is considered as milk for the aged.**

Such sustenance is there in this “milk for the aged,” that, in another work, Dr. Carpenter has this remarkable passage: “The smallest quantity of food upon which life is known to have been supported with vigor, during a prolonged period, is that on which Cornaro states himself to have subsisted. This was no more than twelve ounces a day, chiefly of vegetable matter, with fourteen ounces of light wine, for a period of fifty-eight years.”† Observe the proportion of wine in this diet, and then ask how it is that, in the face of such facts, Dr. Carpenter can deny the nutritive quality of Alcohol. Cornaro lived to the age of 100, so that his liberal proportion of the “slow poison” did not materially injure him. Indeed, according to the irresistible evidence of facts, sobriety seems to play but a small part, if any, in producing longevity, many of the most striking examples of old age being found among the intemperate. Burdach, in reviewing these examples, says: “La sobriété n'a qu'un rôle secondaire dans la production de la longéité.”‡ Thus there is the cooper, Jean Pierre Gardien, who daily drank his glass of brandy, and who, during the last three years of his life, augmented the dose so as to consume 450 *litres* (a litre is nearly a quart) in that period. The two surgeons, Espagno and Politiman, were drunk every night for the last five-and-twenty years of their secular lives; and the celebrated Irishman who lived to the age of 125, and whose “existence fût une ivresse d'un siècle,” may be alluded to as examples of the very tardy operation of the “slow poison.” But we must not strain the argument by exceptional facts like these, or they may prove too much. We allude to them rather as incidental illustra-

* “Letters on Chemistry,” p. 454.

† “Human Physiology,” p. 387.

‡ “Traité de Physiologie,” vol. v. p. 395.

Advantages of Beer—Effect of Alcohol on Digestion.

tions of the power of the organism of *resisting* the effects of this poison—if it be a poison.

Perhaps the reader will learn with surprise that Dr. Carpenter, who in his “Prize Essay” has not a word to say in favor of daily moderate use, though he admits its occasional medicinal use, has in another place* admitted that the daily use of beer may be desirable when the stomach is weak :

There is another class of cases, in which we believe that these malt liquors (bitter beer, Indian pale ale) constitute a better medicine than could be administered under any other form ; those, namely, in which the stomach labors under a permanent deficiency of digestive power, consequent either upon original debility or upon persistence in some unhealthful system during the preceding part of life. There are many such cases, in which no form of medical or hygienic treatment seems able to develop in the stomach that spontaneous power, which it has either completely lost, or which it never possessed, and in which the artificial excitement of an alcoholic stimulus affords the only means of procuring the digestion of the amount of food which the system really requires. Here, then, we consider that as there is but a choice of evils, the sufferer is fully entitled to choose the least ; and we must account the daily use of a tumbler or two of bitter ale a less evil than the constant debility which results from imperfect nutrition, attended as this is with the feeling of utter incapacity for the duties or enjoyments of life, and with a constant liability to the attacks of depressing disease.

If then it be true, as he admits, that “a glass of bitter beer taken with the principal meal of the day does more good and less harm than any medicine the physician can prescribe ;” if it be true that Alcohol assists the most important of all organic processes, nutrition, at a time when the digestive organs are unable to act vigorously, a very strong case must be made out against it, before we should be justified in relinquishing such an auxiliary. Dr. Carpenter makes out a case which is worth attention :

EFFECT UPON THE DIGESTION.—In considering this subject, we shall first examine into the effect of the habitual “moderate” use of alcoholic beverages upon the *digestive* process, whose activity they are commonly asserted to improve. Now this reputed improvement must have reference

* “Scottish Review,” No. I. p. 24.

Alcohol Produces Pleasure—Life makes Life of Wine.

either to the capacity for disposing of a greater quantity of food than the healthy stomach would easily digest, or to an augmentation of the activity and energy of the digestive power, in its operation on the food which the system really requires. Now it may be reasonably asked : If the natural appetite be already good enough to give a relish to the food which the body really needs, can the artificial production of an increased appetite be necessary or desirable ? And if the stomach be already capable of digesting and preparing as much nutriment as may be required to keep up the solids of the blood to their proper amount, can any but prejudicial consequences result from forcing it to execute these operations at a more rapid rate ? Two classes of evils may be expected to proceed from such a system : in the first place, by constant reliance upon an artificial stimulus, the natural powers of the stomach itself must be in danger of becoming gradually impaired ; and secondly, the habitual introduction of more alimentary material into the circulating current than the nutritive functions can appropriate, must predispose to disorder of the system in general, and of the excretory organs.

In this argument there is an all-important If. Our stomach is assumed to be capable of doing its work, and it is then shown to be in danger from assistance. But how many civilized stomachs are thus capable ? The tacit assumption of Teetotalism is, that we are living under perfectly healthy conditions, with hereditary strength of organism, with abundance of excellent food, with stomachs equipped for efficient exercise. In such a case Alcohol is certainly of no use ; but in such a case Alcohol in moderation can do no injury, because of the elasticity of the organism ; and while it does no injury it produces pleasure. Pleasure is something of life. It is a factor we can not leave out of the sum. “The spirit of play,” says one of strange eloquence, “mates with the spirit of wine ; the pleasant emotions and the brilliant saws and dreams of society, like wine-lilies, naturally rock upon the cup, and dip their spirity roots into the beakers. The imaginative skies are vinous then ; Valhalla has the mead, and Odin never eats. . . . The case is purely one of assimilation. If the life can drink the wine, and make life of it, then the wine is food ; if the life be overtapped by the

Wine maketh Glad the Heart—Disadvantages of Abstinence.

wine, which lies in pools in the reeking stomach and above the swampy brains, then there is excess, sensuality, or spiritual drowning. . . . And if wine be good to drink," he continues, "it need not be drunk on pretexts. Men have drunk wine from the beginning for that which is the best and worst of reasons—because they liked it. 'Wine maketh glad the heart of man'—there lies the fortress of its usage. To the wise it is the adjunct of society; the launch of the mind from the care and hindrance of the day; the wheel of emotion; the preparator of inventive idea; the blandness of every sense obedient to the best impulses of the hours when labor is done. Its use is to deepen ease and pleasure on high-tides and at harvest-homes, when endurance is not required; for delight has important functions, and originates life as it were afresh from childhood of sportive feeling, which must recur at seasons for the most of men, or motion itself would stop. . . . The current disadvantages of vowed abstinence, supposing it not to be natural also, appear to lie in a certain dilution of the powers; a certain want of sleep in the faculties; an unending character in the days, or a want of difference between the evening and the morning; also in a certain rigidity of reason, and a loss of those spiritual chances which are a part of the empire of clairvoyance and providence in the mind; and in an undue incessant drift toward public, utilitarian, and money-making enterprise, to compensate for the loss of that stimulus of the heart which to the generality is of festive growth."*

Leaving this dithyrambic defense and turning to Physiology, let us be content with the admission that Alcohol is a stimulus which the generality of men, having weak stomachs, may employ moderately with advantage. Let us call it the milk of old age, and ask Science whether there is any other reason beyond those already given which points to its advantage in old age. We shall venture to suggest an answer; but as it

* J. G. Wilkinson; "The Human Body, and its Connection with Man," p. 172-7.

will be entirely hypothetical, we beg to say that we do not peril our argument on it, we only throw it out discursively, and for the sake of physiological readers. Microscopic anatomists are well aware that the capillaries—the final centers of the nutritive process—undergo a peculiar modification in old age ; the membranous walls become the seats of deposits of fatty granules. Fact number one. In some pathological cases these granules have been found substituted for the elements of the membrane itself, thus diminishing the caliber of the vessel. Fact number two. It requires no long consideration to conclude that such a change in structure must bring with it a corresponding change in function ; and hence this may be one of the many causes of imperfect nutrition in old age. To these two facts let a third be brought, namely, that the granulations are easily detached from the walls by the slightest movement of sudden pressure on the capillaries.* And we complete the series of facts by the well-known influence of Alcohol on the capillaries in determining their sudden contraction and subsequent dilatation. On this basis of fact we erect an hypothesis, namely, that the stimulus of Alcohol is beneficial in old age, because, among other influence, it prevents or removes the deposit of fatty granules in the vessels. We leave the hypothesis to the reader : *quantum valeat.*†

Two other arguments greatly relied on by Teetotalism must now be considered. First, that the effect of Alcohol is only temporary ; second, that moderation must lead to excess, or, in other words, you must increase the dose to produce the original effect. And of the first we may say that the effect is only a temporary effect. All excitement is temporary, for

* Segond: "Anatomie Générale," p. 251.

† We have not overlooked what Dr. Carpenter says, pp. 66-69, on the tendency of the excess of Alcohol to produce various forms of fatty degeneration. The argument from excess is not applicable here. Fatty degeneration doubtless depends on imperfect nutrition, and excess of Alcohol renders nutrition imperfect. But old age, without Alcohol, is subject to this fatty degeneration ; and the point we suggest is, whether this tendency may not be counteracted, in the capillaries at least, by *moderate use.*

Temporary Effects—Comparative Merits of Alcohol and Food.

excitement is a concentration of force ; and as force is not to be created out of nothing, there can be no doubt that a concentration must be a gathering into one point of time what would otherwise extend over a large surface of time, the amount of force being in each case the same. Every stimulus, then, is temporary in its effect. This is no argument against its virtue. If your fire is dull, and you throw into it a piece of lighted paper, this little flame will spread its stimulus, and in a few seconds your fire will blaze : meanwhile, the paper has long since vanished into air and cinders ; but although it was short-lived its influence continues. In like manner, if the over-worked, over-fatigued organism be stimulated with a little beer or wine at dinner, the stimulus itself will soon abate, but its influence on your digestion continues, and enables you to assimilate food which without its aid would have been but half assimilated. So much with respect to stimulus, merely as such. But Alcohol we have shown to be food as well as stimulus ; and if its effects be temporary, why, so are the effects of beef. Indeed, this question of time is idle.

Dr. Carpenter is more cogent when he points out how Alcohol is not in the long run so good a producer of heat and power as food is. The sections of his work in which he examines the comparative merits of Food and Alcohol in enabling men to sustain the extremes of cold or the demands of labor, are so rich in facts, and so important in conclusions, that it is with regret we see them hampered by Teetotal prejudices and vitiated by Teetotal logic. His argument, so long as it is confined to the comparative value of Food and Alcohol, is triumphant ; but he goes on to argue as if a man abstaining from Food and from Alcohol were better off than a man abstaining from Food and taking Alcohol. He does not say this, but he implies it ; the whole drift of his argument as applied to Teetotalism runs in this channel. Beef may be better than brandy ; but brandy is better than no food

Habits of the Stage-coachman—Moderation and Excess.

at all ; and the Temperance question is not, How much better is beef than brandy ? but, What is the value of brandy in itself ? Dr. Carpenter says :

The Author has heard many of the now almost extinct race of stage-coachmen, who had been induced to give up their former habit of imbibing a glass of ale or brandy-and-water at every stage, and to substitute an occasional cup of hot coffee and a rasher of toasted bacon, speak so decidedly in favor of the superior efficacy of the latter system, that he doubts if any man who had the resolution to adopt it, ever returned to his old habits, except from the love of liquor.

This is a good argument in favor of the superiority of food, but it is worthless in the present question. The coachman was benefited in two ways : he could not eat his rasher at every change of horses, as he could "imbibe" his glass of ale ; so that he was not only saved from excess, but he got a substitute in the shape of food. To make good this case, Dr. Carpenter should have shown us how much better the coachman went through his work without "imbibing," but also without eating.

Now for the second position : Moderation must lead to excess, because to secure the original effect you must increase the dose, and continue increasing it. He who drinks will drink again, and Moderation, we know, oils the hinges of the gate leading to Excess. No one doubts the danger. The only absolute preservative against taking too much is to take none. But to suppose there is any necessary physiological connection between moderation and excess, is to ignore physiology and to fly in the face of evidence. Dr. Carpenter lends this error the advantage of his authority, although we are not to suppose he maintains it in its naked absurdity ; he clothes and conceals it thus :

If the stomach be not an exception to the general law of the action of stimulants upon the animal body, we should expect that by the habitual over-excitement of its function, in however trifling a degree, its vital energy will undergo a premature depression ; and that the result of the "moderate" use of alcoholic stimulants will manifest itself, sooner or later, in diminution of the digestive power.

Habitual Over-Excitement and Occasional Excitement—Stimulus of Tea.

Such is most commonly the fact; the earliest indication of it being, in most instances, the demand for the *augmentation* of the amount of stimulus, to produce the same result, that which was at first sufficient to whet the appetite and increase the digestive power being no longer found adequate. If the demand be yielded to, and the quantity of the stimulus be augmented, the original benefit seems for a time to be afforded by it; but after the stomach has become tolerant of the liquor, that which at first excited it to increased functional activity does so no longer, and a further increase is called for; until what began in "moderation" ends in positive *excess*, with all its consequent evils.

The clothing here is the phrase "habitual over-excitement." This makes his reasoning cogent, but this removes the question to another ground. The point at issue is not *habitual* over-excitement, but *occasional* excitement; we are not considering the case of a man who vitiates his organization by taking stimulus twenty times a day, but of a man who takes it once or twice a day; cases in which there is all the difference between eating a chop twenty times a day, and a chop twice a day. Restricted within such limits, "the general law of the action of stimulants" most assuredly does not suggest that the dose must be increased to produce the effect, and that what was "at first sufficient to whet the appetite and increase the digestive power," is now inadequate. Experience is very emphatic on this point. Men take their pint of beer or pint of wine daily for a series of years; this dose daily produces its effect; and if at any time it be increased—if thirst or society make them drink a quart in lieu of a pint—they are at once made aware of the excess. Men drink one or two cups of tea or coffee at breakfast with unvarying regularity for a whole lifetime; but who ever felt the necessity of gradually increasing the amount to three, four, five cups? Yet we know what a stimulus tea is; we know that treble the amount of our daily consumption would induce paralysis; why are we not irresistibly led to this fatal excess? Every time fresh oil is poured on fresh coal the same phenomenon presents itself; every time an eel is skinned he

Change the Law of Being—The Hunter and the Hack.

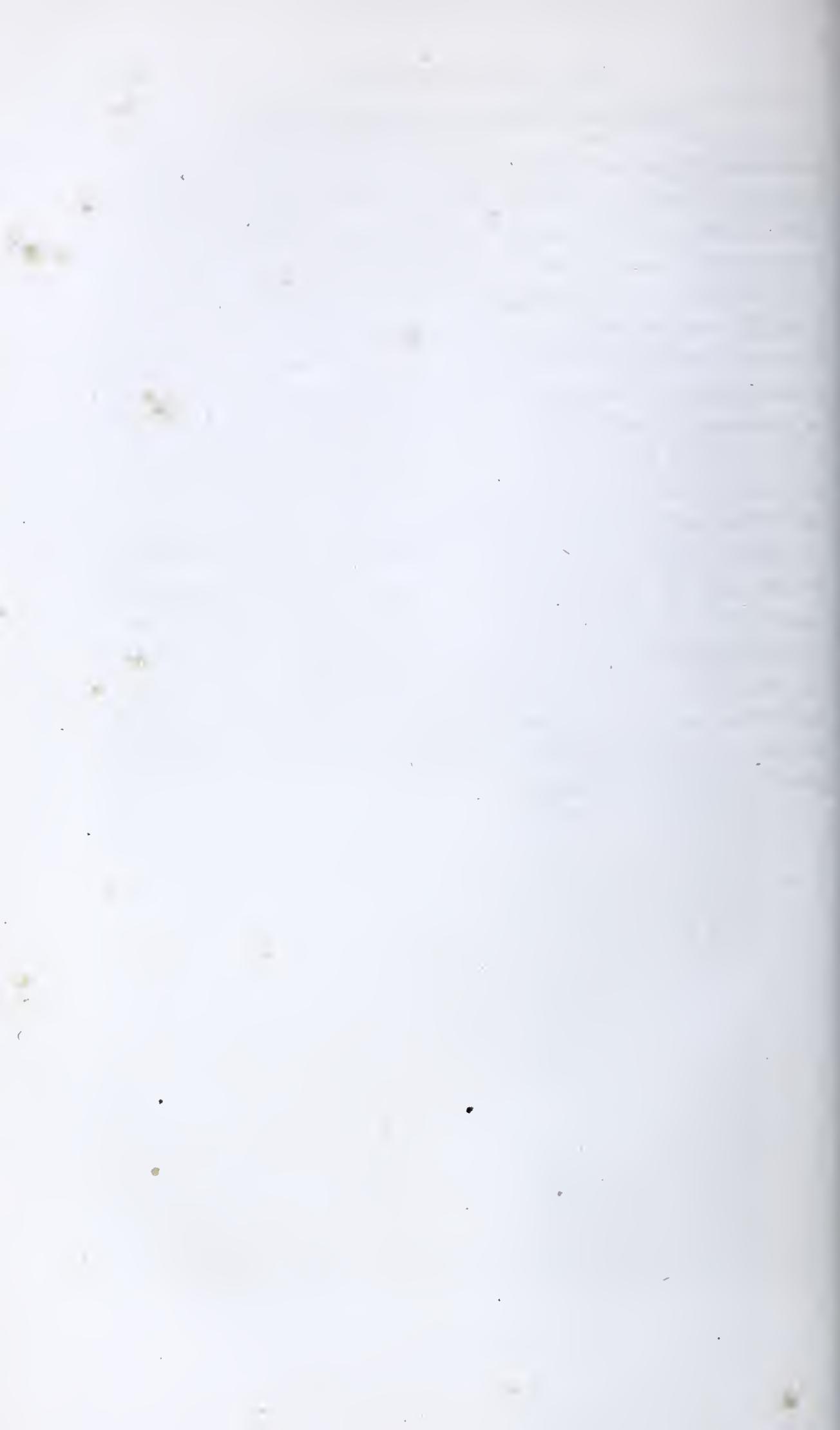
wriggles with ancestral vigor and will not become "used to it;" and in like manner every time a fresh stimulus is applied to fresh nerve-tissue the old effect ensues. For we must not forget this: the tissue burnt to-day is not the tissue burnt yesterday; the nerve-particles stimulated into activity to-day will not be living to-morrow when fresh stimulus is applied. Change, incessant change, is the law of our being. Fresh food renewing fresh tissue for fresh stimulus. The basket is always wriggling with eels, but the eels are strangers, and can't get used to skinning.

This may help us to clear up some of the obscurity over-hanging the question of our organisms becoming hardened to certain influences. So long as the stimulus is kept within certain limits, the bent spring rebounds to its original position, the elastic web recovers its original length, the organic disturbance is temporary, and does not produce a change of structure; but exceed those limits, you break the spring, tear the web, and deteriorate the tissue. In the one case the food grows into new tissue similar to the old; and being similar, will exhibit similar susceptibility. In the other case the food grows into imperfect tissue; the original conditions of nutrition are so impaired, that the organism does not manifest its old susceptibility, and to get the old amount of force you must apply an intenser stimulus. The active, well-fed hunter starts into a gallop at the mere hint of the spur; the ill-fed, wearied hack must have his sides bleeding before he will exert such energy. Teetotallers do not know, or knowing, they forget, that a small dose, the effect of which is only a temporary stimulus, produces no alteration in the repair of waste tissue, and consequently that the new tissue is as susceptible as the old, so that an increase of the dose is unnecessary; and if they would interrogate vulgar experience, they would learn that although moderation does frequently lead to excess, there is no sort of necessity in the sequence. It will not do to cite cases in which the organism *grows* to a

Review of the Argument—Alcohol a Tricksy Spirit.

certain disproportion, adapts itself to new conditions. Physiology is at present unable to explain such secrets. But fact tells us that stimulus is taken daily by thousands and thousands who do not increase the amount as they advance in life.

Reviewing our argument, previous to closing it, we find that Teetotalism can only maintain its position as a scientific theory by proving that whatever is true of excess is true in a minor degree of moderation ; that Alcohol poisonous in excess is poisonous in moderation ; that Alcohol is pernicious because it is not food ; that its assistance is delusive because temporary, and in its results dangerous ; and that moderation is not only deteriorous in itself, but still more so in leading inevitably to excess. Every one of these arguments we have answered. Every one of these positions we have shown untenable against the evidence of logic, science, and fact. But in arguing thus, it may appear that we lay more stress on the benefit to be derived from Alcohol than we really do. It is a very dangerous, tricksy spirit, needing the power of a Prospero to make it beautifully obedient ; needing sagacity and self-command to make it a blessing.



R E V I E W.

THAT the reader may understand at once and distinctly the whole ground I shall occupy in this controversy, I will at the outset apprise him that I shall undertake to establish the truth of the following propositions :

1. That Alcohol is essentially poisonous in all quantities and under all circumstances.
2. That Alcohol is never a food in any sense whatever, nor under any circumstances.
3. That Alcohol is inimical to every thing that possesses life, whether of the animal or vegetable kingdom.
4. That Alcohol never imparts material of nutriment nor material of force to the living organism, but always and invariably occasions *the waste or expenditure* of both vital force and nutrient material.
5. That Alcohol under no circumstances, either of health or disease, supports vitality.
6. That Alcohol is always poisonous and injurious in proportion to the quantity taken, other circumstances being equal.
7. That all use of alcoholic drink is abuse, being always and under all circumstances, whether employed as a medicine or a beverage, a violation of physiological law.

Having thus antagonized all the leading positions of the writer as flatly and directly as I can employ language, I am prepared to enter upon the argument.

I am quite well aware that some of the positions just laid down will be regarded as "radical," "ultra," or "fanatical,"

Radical Propositions—Intrinsic Nature of Alcohol.

even by temperance folks. But I have always found truth to be both ultra and radical. It is *never* "between two extremes," but *always* one extreme or the other of a given proposition. And so it will be found, *when* found, in the present discussion.

It has always been the misfortune of the temperance cause, that its advocates have so seldom placed it before the public on its correct scientific basis. The opinions of medical men generally, and of nearly all medical schools, in relation to the uses, actions, and operative effects of alcoholic medicines and beverages, being erroneous, have had a disastrous and are now exerting a paralyzing influence on the cause of temperance reform and of human progress.

Should I utter opinions or interpret facts differently from the prevailing theories of medical men ; should I even contradict or refute the opinions of men whom the whole civilized world has been taught to recognize as the "highest authority" in chemistry and physiology, I beg the reader to remember that in matters of science, open to the investigation of all alike, we are to call no man master.

I do fear, however, that possibly there may be some, even among the distinguished friends of temperance, who would not like to see all of its true principles fully presented and plainly demonstrated to the world ; for perchance the same argument which proves Alcohol an enemy to life, might convict them of being as great sinners physiologically, in the use of *other* poisons, as liquor-drinkers are in the employment of the alcoholic poison.

As all the propositions involved in the general subject are more or less merged in the primary one, we may as well dispose of this in the beginning.

Is ALCOHOL A POISON "ESSENTIALLY?"

Is Alcohol a poison, or a food, or both ? My opponent contends that it is both ; that is to say, either, according to

Teachings of Nature—Radical Distinction between Food and Poison.

circumstances—sometimes a poison, at other times a food. I contend it is always a poison and never a food.

To my understanding the idea of poisonous food is preposterous. Pereira, who adopts Liebig's notion of respiratory aliments, calls Alcohol an "obnoxious food." It warms and supports the system, and at the same time destroys it! Is not such language, judged by the rule of common sense, flat absurdity? All the difficulty with our authors comes from not having a rule to determine the essential character of an article, whether it be food or poison. Nature has given us this rule, and she has enstamped it on all within us, and written it on all around us, and yet learned men can neither feel it nor see it!

It is true that an article of food may be accidentally impregnated with material which is not nutritious—with poison—but such accidental impregnation constitutes no part of the food proper. It is the same food still. Nor is the food any less food because of the poisonous admixture.

Our author would have Alcohol poisonous or nutritious according to dose, or according to the condition of the person taking it. How would it sound to call a small piece of bread nutritious and a large piece poisonous? Or to say that potato was food to a hearty man who could digest it comfortably, and poison to a dyspeptic whose stomach could not digest it at all?

Yet this is precisely the reasoning of the Westminster Review. Our author makes no natural, radical distinction. He makes the *nature* of the thing to depend on the *quantity* used and the *condition* of the person using it. This is certainly absurd. The Alcohol, and the bread, and the potato are always of the same *essential* nature. They have always and under all circumstances the same fixed relation to the organism, whether the organism can successfully resist the one or not, or successfully appropriate the other or not.

To say that potato is poison when the stomach can not

Definition of Food—Definition of Poison.

digest it, and that Alcohol is a food when the system successfully casts it out, is like arguing that wood is a supporter of combustion when it happens to make the fire burn, and a non-combustible when there happens to be no flame to decompose it. It is like arguing that water is poison when it freezes us and food when it warms us.

No, no. Alcohol is poison ; potato is food, and water is—water, naturally, necessarily, always, under all circumstances.

But our first premise, our fundamental proposition, lies farther back.

WHAT IS FOOD AND WHAT IS POISON ?

The explanation which our author has attempted will not bear a moment's criticism. According to his logic, any thing and every thing may be or may not be food ; and any thing and every thing may be or may not be poison. I will prove that arsenic, copper, vitriol, antimony, opium, tobacco, henbane, the bohun upas, and the boa constrictor are as much food as Alcohol is, and by precisely the same data by which our author makes Alcohol "respiratory food."

Now *food* is any material capable of transformation into tissue or structure. It must of course be susceptible of undergoing digestion and assimilation. This is true of both animals and vegetables.

Poison, on the contrary, is any material chemically incompatible with the tissues or structures. This is true, also, of both animals and vegetables.

These definitions imply natural, fixed, permanent, and invariable properties and relations. They imply that there are a great variety of foods and many degrees of poisons ; and they imply that food is never convertible into poison nor poison into food. Poison can never *supply* tissue nor force ; food may or may not, as it is used or abused.

We have two ways of determining, in relation to animals, whether a given substance be a food or a poison.

Rules to Distinguish between Poisons and Foods.

1. All nutrient material—all food, is prepared in the formative processes of vegetables; it is produced or created in the processes of growth and development, and *never* in the processes of decay, decomposition, or putrefaction.

Animals can not create or form nourishment of any kind. They can only *appropriate* what is ready formed in vegetables. It is true an animal can get nourishment by eating another animal, but the animal eaten can only supply the alimentary principles originally derived from the vegetable kingdom.

If we submit sugar, starch, gum, gluten, fibrin, casein, albumen, etc., to this test, we find they *may be* alimentary substances, because they are produced in the development and growth of vegetables. They constitute what are called the *proximate principles* of food, in contradistinction to *chemical elements* on the one hand, and *aliments* or *foods proper* on the other. Wheat, rice, potato, apples, etc., are *aliments*; while sugar, starch, gluten, etc., are *alimentary principles*. The aliments are compounds of the alimentary principles, and these are compounds of the simple or *chemical elements*, oxygen, hydrogen, carbon, nitrogen, etc.

If we judge Alcohol by the same rule, we see that it is just as far from the nature, and character, and qualities of food as it is possible for any thing to be. It is not produced by any process of formation, growth, or development whatever. It is always a product of decay and decomposition. It results from fermentation. *Fermentation* is exactly the opposite of *formation*. This is a constructive process; that is, a rotting process, a process of destruction and putrefaction. One process compounds simpler into more complex forms of matter; the other resolves compounds into their simple or ultimate elements. One process manufactures food; the other destroys it. The product in one case, if taken into the stomach, is nutritious; the product in the other case, when taken into the stomach, is poisonous.

The reader will please bear in mind that I do *not* say that

How Food is Produced—Alcohol Results from Fermentation.

every thing which is produced in the processes of vegetable growth is food. Many virulent poisons are so produced, as opium and tobacco. I only say that food *is produced* in this way, and in *no other*, and that whatever is not so produced can not be food; hence Alcohol, not being so produced, can not be food.

Alcohol, then, is a poison, because it results from fermentation, decay, decomposition, and because all such products are poisonous. No such products are convertible into structure, hence they are not food; all such products are chemically incompatible with the living structures, hence they are poisons.

2. But we have another test still more conclusive. The physiological or pathological effects of Alcohol are in all respects analogous to those of all admitted poisons, and totally unlike those of any alimentary substance whatever. This brings up what are called, in medical parlance, the operative effects, the *modus operandi* of Alcohol; and here we may lay down another general, and, indeed, universal rule.

All poisons injure the structures and disturb the functions of the body, in all quantities, these effects being precisely according to dose, other circumstances being equal. All food, on the contrary, in moderate quantities, never injures the structures nor disturbs the functions. Food is only injurious in excessive quantities, whereas Alcohol is injurious in all quantities.

This point has been established by a multitude of experiments. Let us glance at a few of them.

Pereira, author of "Food and Diet," "Materia Medica," etc., than whom there is no higher authority on these subjects in the medical profession, in summing up the experiments of applying Alcohol to different vegetables, uses the following language:

"Alcohol acts on plants as a rapid and caustic poison. Its effects are analogous to those of hydrocyanic acid." As

Modus Operandi of Alcohol—Its Effects on Plants and Animals.

hydrocyanic (Prussic) acid is one of the most deadly poisons known, it does not appear that there need be any great difficulty in understanding the nature of Alcohol in relation to the vegetable kingdom. If it supplies "force," the force is of the killing kind. If it is a "respiratory food" to plants, it is as murderously "obnoxious" as it is to man. Is there any thing known in food which can be made to occasion similar effects? Most certainly not.

As to the effects of Alcohol on animals, Pereira tells us: "Leeches, immersed in spirit, die in two or three minutes." Fontana found that when half the body of a leech was plunged in spirit, the part lost its motion, while the other half continued in action. The same experimentalist observed that spirit killed frogs when administered by the stomach, injected beneath the skin, or applied to the brain or spinal marrow. Applied to the right crural nerve of a frog, Alcohol destroyed the power of moving the right foot. Monro observed that Alcohol, applied to the hind legs of a frog, rendered the pulsation of the heart less frequent, and diminished sensibility and mobility. Fontana states that turtles were killed by spirit administered by the stomach, or applied to the lower portion of the bowels, or injected through the skin.

Flourens tried many experiments on birds, and found Alcohol, applied to the cerebellum, to have more injurious effects on the senses, faculties, and movements of the animals than did the removal of this part of the brain by the knife!

Alcohol has also been tried on fishes. Pereira says: "If a little spirit be added to water, in which are contained some minnows, the little animals make a few spasmodic leaps, and become incapable of retaining their proper position in the water, but float on their sides or back." This is equivalent to accusing the fishes of being drunk.

Alcohol has been experimented with on domestic animals. It has been introduced into the stomachs of cats, dogs, horses, sheep, rabbits, and Guinea-pigs, and in all cases there was a

Alcoholic Experiments on Man—Pereira and Beaumont.

powerful excitement of the brain, followed by an apoplectic condition; and a post-mortem examination in each case revealed inflammation of the stomach. Says Pereira: "Four drachms of Alcohol, injected into the jugular-vein of a dog, coagulated the blood and caused instant death."

Alcohol has been tested on man quite as extensively as on the inferior animals.

"The *local* effects of Alcohol, or rectified spirit," says Pereira, "are those of a powerfully irritant and caustic poison. To whatever part of the body applied it causes contraction and condensation of the tissue, and gives rise to pain, heat, redness, and other symptoms of inflammation. These effects depend partially or wholly on the chemical influence of Alcohol over the constituents of the tissues, for the affinity of this liquid for water causes it to abstract the latter from soft living parts with which Alcohol is placed in contact; and when these are of an albuminous or fibrinous nature, it coagulates the liquid albumen or fibrin."

Again, says Pereira: "The irritation and inflammation set up in parts to which Alcohol has been applied, depends (in part) on the *resistance* which the living tissue makes to the chemical influence of the poison; in other words, it is the reaction of the vital powers, brought about by the chemical action of the Alcohol."

"But," continues Pereira, "besides the local influence of this liquid dependent on its affinity, we can hardly refuse to admit a *dynamical action* in virtue of which it sets up local irritation and inflammation, independent of its chemical agency. Dr. Beaumont, in his experiments on St. Martin (whose stomach was perforated by a musket-ball, through which foods and liquids were directly introduced), found that all forms of alcoholic beverages invariably produced an inflammatory state of the stomach, and retarded digestion."

The constitutional or remote effects of Alcohol are divided by Pereira into three stages or degrees of intensity: 1. Ex-

Specific Alcoholic Diseases—Alcohol as a Remedy.

citement. 2. Intoxication or drunkenness. 3. Coma, or true apoplexy.

In all these experiments, then, we see nothing in the effects or operations of Alcohol, however taken or applied, in whatever form or quantity employed, but disease and death. Is there any thing analogous to this in any sort of food under the sun? Is there any thing known among men, except things *essentially* poisonous, which are at all analogous?

Medical authors name several specific diseases which are very frequently attributable to Alcohol, as *insanity*, *delirium tremens*, *mania à potu*, *tubercles of the liver*, *dropsy*, *inflammatory*, *dispeptic*, and *schirrous state of the stomach*, *granular disease of the kidneys*, etc., etc.

As a remedy, Alcohol is classed among narcotics, stimulants, nervines, caustics, and antiseptics.

Narcotics are agents which *stupify* the brain and nervous system, as *henbane*, *Prussic acid*, *belladonna*, *deadly nightshade*, etc.

Nervines are agents which *excite* and *exhilarate* the brain and nervous system, as *sulphuric ether*, *castor*, *musk*, *assafœtida*, *coccus indicus*, etc.

Stimulants are agents which occasion a preternatural increase of the general temperature and superficial circulation, as *capsicum*, *mustard*, *ammonia*, *phosphorous*, etc.

Caustics are agents which occasion the destruction of the surface or structure to which they are applied, as *aquafortis*, *oil of vitriol*, *oil of capsicum*, *tartarized antimony*, *nitrate of silver*, etc.

Antiseptics are agents which prevent the changes, motions, or transformations of organic matter, and hence render it so far dead and inanimate, as *tannin*, *vinegar*, *arsenic*, *corrosive sublimate*, etc.

Now Alcohol is, medically and toxicologically, like unto each and all of the above agents, and each and all of them are poisonous "essentially." Why is not Alcohol also?

A Ludicrous Mistake—Alcohol not Respiratory Food.

The Westminster Review replies, substantially: Because it is *used* in the organic economy; because it *warms* the system; because it is a *respiratory* food, and thus supplies an element of force.

It is used, is it? How? Just as the Westminster Review man would *use* a mad dog that had invaded his office. He would expel him, *turn* him out perhaps, even though the effort of so doing proved quite a warming operation. It would be a ludicrous, yet sad mistake, if he should suppose the force he had exerted in getting rid of the mad dog was force *derived from* the mad dog! Yet our author has made just such a mistake, as we shall see presently.

ALCOHOL IS NOT RESPIRATORY FOOD.

Having shown, by evidence which I do not think will or can be successfully controverted, that Alcohol is *essentially poisonous*, I now proceed to demonstrate as conclusively, that it is not a respiratory food.

I have already, I trust, satisfactorily proven that it is not nutritive nor alimentary, in any sense, of structure or tissue-forming food. But it is alleged to be respiratory food; that is to say, it is a supporter of combustion in the vital domain, like sugar, starch, etc. What if it turns out that neither sugar nor starch are used in this way; that this whole theory of respiratory food, which Liebig invented to reconcile science with man's foolish habits, and which has led all the world astray, is just one grand mistake? But we will not anticipate.

That Alcohol is not an alimentary principle in any sense that starch or sugar is, is disproved by the fact of its being a product of fermentation, as already explained. Sugar and starch are products of formation. Alcohol results from the destruction of sugar. Sugar is the only substance which, by undergoing fermentation, can furnish the elements which will unite so as to form Alcohol.

Formation of Alcohol—How it is Burned in the System.

It is true the cereal grains and starchy tubers are generally employed in the manufacture of Alcohol, but their starch, when subjected to certain conditions of temperature and moisture—circumstances favorable to decay and decomposition—is first converted into sugar—a process so far of retrogradation—and then the sugar, by a continuation of the rotting or retrograding process, is resolved into various elements, which unite in such proportions as to form carbonic acid gas, water, and Alcohol.

Here is the whole theory of “bread with the gin in it.” Panary fermentation generates Alcohol (not gin) as well as carbonic acid gas. It is the carbonic acid gas which puffs up the dough and makes the bread light, while the Alcohol is not completely dissipated till several hours after the loaf comes from the oven; and this is the reason why newly baked bread is always comparatively unwholesome and indigestible; and the explanation of the superior wholesomeness of unleavened bread is found in the fact, that fermentation destroys some portion of some of the alimentary principles, and leaves the “insidious poison,” Alcohol, in their place.

But Alcohol is said to be a “respiratory food.” How does our author prove this? Why, according to Liebig, it warms the system. So does Cayenne pepper; so does corrosive sublimate; so does quinine; so does arsenic; so does fever and inflammation; so do gout and rheumatism; so do spasms and convulsions. Are not all of these drugs and diseases “respiratory food” as well? Indeed, the system is rather warmer under the operation of some of these agents than under the ordinary dietetic employment of ardent spirits. Why, then, are not they *superior kinds* of respiratory foods?

But Alcohol is *burnt* in the system; it supplies an element to be consumed, oxydized, and thus saves the tissues from consuming themselves. So are the dead particles of the organism, the effete materials of the body generally, consumed. They are oxydized or burnt in the same way precisely.

Grand Fundamental Error—Mistake of Liebig and others.

Why are not these dead and effete matters “respiratory food?” If our author’s reasoning is sound they are such, for Alcohol is really as effete, as putrescent, as dead, as excrementitious, physiologically, as they are; for it is produced, as we have already seen, in precisely the same way—decay, decomposition.

On this reasoning, sweat, and bile, and urine, and feces, and all the cast-off materials of the body, are respiratory food. Why not use them over again, and so save the expense of new material which has never been digested? If this theory be true, the excrementitious matters ought to be eaten instead of being returned to dust as fertilizing elements!

Again, Alcohol is said to be an element of *force*. All food, we are told, is useful only as it supplies the element of force. Very true; but force implies simply motion, action, contraction. All force, motion, and action is but the *contraction of muscular fiber*. Muscular fiber is a tissue, so that no food can supply force only as it is converted into tissue.

Here, then, we come to the great grand fallacy of our author; the blunder of Liebig, Pereira, and Carpenter; the mistake, indeed, of nearly the whole of the medical profession. I must admit that on this point the Westminster Review has the opinion of these learned men in favor of his main position. It is true that Liebig classes “wine, beer, and brandy” as respiratory food, it is true that Pereira gives us Alcohol as an alimentary principle; and it is true that Carpenter and other physiologists admit that Alcohol sustains the vital forces; and it is true, “and pity ‘tis, ‘tis true,” that the majority of the advocates of total abstinence, with the great body of medical men of all schools, believe that Alcohol is capable, in some way, of imparting strength to the system, or at least of supporting it under debilitating and depressing influences.

If this point is to be settled by the mere opinion of those who are acknowledged to be learned men, I have nothing to say. They are generally on the side of my opponent. But

Mistake of Medical Authors—Alcohol is not Force.

I have a higher authority to appeal to than that of all the learned men of all the world; an authority infallible on this as on all subjects, however liable misguided mortals are to misinterpret it—the teachings of science and the laws of nature. Let us there seek for the truth of our subject.

Now the great mistake of the authors whose opinions and data have afforded the Westminster Review all the strong points of its argument against teetotalism (and which, if correct, render its argument invincible, I am frank to confess), as I think I can abundantly prove, is simply this: They have mistaken a *destructive* for a *constructive* process; they have mistaken a *waste* for a *supply* of vital force; they have mistaken a *feverish heat* for a *warming* operation; they have mistaken an *inflammatory action* for a *reparative process*; they have mistaken an effort of the system to *get rid of a poison* for *increased vitality*; they have mistaken the *symptoms of poisoning* for *manifestations of nutrition*; they have mistaken the *evidences of disease* for the *indications of health*; in a word, they have mistaken *Alcohol* for *food*; and disastrous too, not only to the temperance cause, but to medical science, has been this mistake!

The logic of our author culminates in the following postulate: "Food, of whatever kind, is ultimately translated into force. Force is the end and aim of food. If food is force and Alcohol is force, Alcohol must necessarily be food."

But what if Alcohol is *not* force? Then all the imposing superstructure you have raised on that "if" tumbles to the ground. I will prove that it is not force; nay, I will show that Alcohol is so far from being force, or an element of force, that it is exactly the contrary, the thing forced.

ALCOHOL, INSTEAD OF SUPPLYING FORCE, ABSTRACTS IT.

I must now indicate the law or rule by which this branch of our discussion is to be settled. It is the relation between living matter and all other matter; the law of relation between

The Fundamental Fallacy—Nature of Vital Force.

vitality and materiality. We must first see what it is that distinguishes living matter from Alcohol and other forms of inanimate matter; between the living system and all foods and all poisons. It is this:

Living matter acts upon food as nutrient materials, to appropriate them to uses—to convert them into structure. The food does not act on the system—does not “stimulate the stomach,” as is the common notion, but is acted on by the stomach, and by the whole organism.

Living matter, also, acts on all injurious or extraneous matters—on poisons—not to appropriate and use them—for this is impossible—but to eject, to expel, to get rid of them. The poison does not act on the system, as is commonly supposed, for this is a dead, inanimate, passive substance, but the living, moving, sensitive, animate machinery of vitality acts on it, and casts it out of the body through the excretory organs, the lungs, liver, skin, kidneys, and bowels.

Now in either case there is force exerted. But where does the force come from, and what is it?

This brings us to the fundamental fallacy of our author and of the schools. Force is the action of the living tissue; simply the contraction of muscular fiber. This force—this action is exerted for two immediate objects: to convert alimentary materials into structure, and to carry out or expel the effete or disintegrated tissue. So far the action is *physiological*, natural, or healthy, because it relates simply to the ordinary functional duties. There is here no waste of vitality.

But force is also exerted to resist and to expel morbid agents—things incompatible with normal functional action and normal structure. This action is called *pathological*, *unnatural*, or *morbid*, because it relates solely to what is foreign to the organism—to what is not wanted, not usable, and only an enemy in the vital domain. It is, in other words, *disease*.

Force exerted in this way is a needless waste of vital power. It is like the force a country or a nation exerts in warring against an enemy that has taken possession of a portion of its territory. It is the force of diseased action, of fever, of inflammation, etc. It is the force which goes *out from* the living being, to be expended in resisting the enemy. If there were no enemy to contend with, this force could all be employed in sustaining the integrity of the organism, and regulating its variable conditions of light, air, food, drink, temperature, passional influences, etc., to the best advantage.

But as there is an enemy present (as when Alcohol is taken), it must be expelled, and an amount of vital force must be expended, sacrificed, proportionate to the strength of the enemy ; that is to say, the size of the dose.

Here we see *how* it is that Alcohol is an element of force. It *occasions* force to be wasted, and that is all, as might be inferred from the trembling nerves and unsteady gait of the person who has imbibed long and largely. If a small draught is taken, only a little force is wasted (not supplied) in defending the system from it, and the individual is but slightly excited ; that is, a little feverish. If much is taken, a greater amount of force is necessarily wasted (not supplied), and greater excitement or stimulative is manifested in inflammation, fever, delirium, madness, etc.

Here we see, too, the radical error of the advocates of temperance who have undertaken to reply to the arguments of the Westminster Review. They have all admitted what is not true, and what utterly defeats their own argument. They have all admitted that Alcohol does impart or supply an element of force to the system ; but, say they, it is a "dangerous force ;" it is "not the right kind of force," "it is too powerful a force ;" it is "an ungovernable force ;" it "can not be regulated," etc.

We are at once relieved from all these difficulties by placing the force just where it belongs, in the living, acting organ-

Modus Operandi of Alcohol—Rationale of its Effects.

ism. The system expends *its* force to get rid of the Alcohol, but never derives any force, great or small, good, bad, or indifferent, *from* the Alcohol.

But let me illustrate, still more conclusively, the fact, that vital force is used in relation to food, and wasted in relation to Alcohol. I admit that Liebig, Pereira, Carpenter, and all the medical profession, agree with my opponent, that agents, whether of food, medicine, or poison, act on the living system. And then I appeal from them to nature herself. And I do, on the authority of her teaching, assert that these agents do not act on the living system at all, but that wholly and always the action is on the part of the vital organism.

Let us bring our main element of controversy, Alcohol, and an article universally acknowledged to be food, bread (*without* the gin in it), for example, and an article as universally conceded to be *essentially* poisonous (I would have said arsenic, but mine adversary has proved this to be an admirable nourishment—even better than Alcohol, for this only warms, and that rejuvenates !), say the virus of the rattlesnake, for example, in contact with the vital domain, and see what results. Suppose we try them first on the outer surface, and then within the citadel of life.

Rub a little Alcohol on the skin. There is redness, heat, pain, and swelling ; in other words, the skin is inflamed. Medical authors give us these very symptoms—redness, heat, pain, and swelling—as constituting the *diagnosis* of inflammation. This inflammation implies and is produced by increased action ; there is an exertion of force. But how ? Why ?

The force comes from within ; it is not imparted by the Alcohol, nor does it result from the oxydation of the Alcohol by which the system is warmed, for in this case the bodily temperature, except in the inflamed part, is as often lowered as otherwise. The blood is sent to the point attacked to defend it. The blood of course comes from within, and by the action of the muscular fibers of the blood-vessels.

Alcohol and Rattlesnake's Virus Compared.

In this case surely the action is on the part of the living system, and the object of the action is to get rid of, or defend the surface from, the Alcohol ; and this effort, though in itself remedial, is really the disease—the inflammation.

Then apply the bread to the skin. What does it do ? Nothing. What is done to it ? It is resisted too, not as a poison which is incompatible with the structures and inimical to life, but as an injurious substance *in that place*. It is still food, but not usable there ; and by mechanically obstructing the pores, and by interposing an obstacle between one of the organs of sense—the skin—and the external world, it is injurious. Yet it is not a poison, nor does it occasion that violent resistant action that we see in the case of Alcohol.

Now bring forward the rattlesnake—*Caudisona horrida*—carefully open his hideous mouth, pull out the fatal fangs, and at their roots find a little bag filled with its missile of death. Rub this fluid on the skin. Soon you will see the following symptoms : redness, heat, pain, swelling, hence we diagnose inflammation, as in the case of Alcohol.

There is greater warmth, increased circulation, intensified action. Here is an element of force, or at least an exertion of force. What does it mean ?

Our author, to be consistent, must argue that “*if* food is force, and rattlesnake's virus is force, rattlesnake's virus must necessarily be food !” There is no possible way, on his own premises, for our author to escape from the conclusion, that rattlesnake's virus is “a better respiratory food than sugar, starch, or even flesh ;” in fact, almost as good a food as Alcohol !

If the value of the food is to be adjudged by the amount of force manifested in its “combustion,” then rattlesnake's virus is a better food than Alcohol, in the proportion of ten thousand to one ; for a tenth part of a drop will elicit as much force—redness, heat, pain, swelling, etc.—as will a thousand drops of Alcohol ; and it is better food than bread, by a proportion

Proving Too Much—Alcohol Within the System.

beyond the power of ciphering, for the hundredth part of a drop elicits from the whole organism an amount of force that often ends in death in a few hours. Whereas the bread occasions so slight a manifestation of force, that the exertion of it is scarcely perceptible.

We prove, then, that the venomous secretion of the rattlesnake is just about ten thousand times as *nutritious* as Alcohol, and as much as one million times as alimentary as bread! Peradventure we have proved *too* much, which is even more fatal to a theory than proving too little.

But we have (if possible) a more conclusive demonstration in the action which results when the same articles are taken internally. We can not, of course, conduct this experimentalism unless somebody will consent to be poisoned with a big or nourished with a little dose of Alcohol and the *other* virus. As the doctrine of teetotalism is “*taste not, handle not, touch not,*” we shall have to victimize an Anti-Maine Law man for the benefit of science.

Let the anti-prohibitionist, then, swallow a moderate dose of Alcohol. Watch the result Redness, heat, pain, swelling of the mucous membrane—*inflammation* again; an exertion of force again; a “*respiratory food*” again. The mouth stings, the throat is parched, the stomach burns, the circulation is disturbed, the head is dizzy, the brain whirls, all because the Alcohol is offering itself as a sacrifice to make force for the body. How beautiful! It ought to be sainted and canonized for its good offices. Indeed, it has been.

But it always happens (how strangely!) that all such force makes the organism sick, and diseased, and prematurely decrepit, just in proportion to the amount of force in this way created. Does this prove that force is *supplied to the system abstracted from it* in the operation?

So much for the internal *use* (?) of Alcohol. Now for the bread. This may be tried on a Maine Law man. Let him masticate it well, hold it in the mouth as long as he pleases,

Modus Operandi of Rattlesnake's Virus—Its Medicinal Uses.

even though the quantity be very considerable, there is no irritation, no disturbance; there is no inflammatory diagnosis, nor is there any general commotion in the temperature and circulation indicative of fever, of vital resistance, and expenditure of vital power. If he eats too much, it will oppress and overload the stomach, and induce obstruction; but there is no manifestation of poisoning, no violent rally of the vital forces, as in the cases of the two viruses, the alcoholic and the serpentine.

Lastly, let an individual swallow the virus of the rattlesnake. It will not poison him so severely as when rubbed into the skin, for the reason that the mucous coat of the alimentary tract can pour out fluids, serum and mucus, to defend itself to a great extent; whereas, when inserted under the skin, it goes at once into the mass of blood.

Now a moderate dose of rattlesnake's virus, taken into the stomach,* operates very analogously to a moderate dose of "lemon punch," or "whisky toddy," or "egg nogg," or "brandy sling," with plenty of nutmeg; or, "wine sangaree," with a touch of *coccus indicus*; or, a large dose of "lager beer," followed by a very large pipe or a very long cigar. All occasion a sense of warmth, a feeling of stimulation which is more or less pleasurable, as one is more or less accustomed to similar poisonings, and some degree of a half-delirious mental reverie, and a sensuously-exhilarated state of the bodily functions, which our author calls "pleasure."

Let us observe, too, how differently the organism acts upon or in relation to foods and poisons. When bread or other food is taken into the mouth, a salivary fluid is secreted to dissolve it; in the stomach, the gastric juice is poured out upon it to complete its solution; below the stomach, the pancreatic juice assists in its further elaboration, all of these processes contemplating its final conversion into the substance of our bodies.

* It has been often administered as a medicine in cases of asthma, dyspnœa, etc.

Absurdity of Alcoholic Food—Spanish Flies.

But how are the twin-viruses we have been considering managed? Precisely in the way best calculated to get them out of the system with as little wear and tear of tissue, with as little waste of force material as possible. When Alcohol or other poison is taken into the system, we have, instead of the digestive juices, an outpouring of a watery and viscid fluid (serum and mucus) from the whole mucous membrane, contemplating the expulsion of the enemy from the system. If the quantity of the poison is large and the danger imminent, all the secreting glands, and all the excreting organs are engaged in the defensive and expulsive operation. Of course there is disturbance, commotion, fever, irritation, inflammation, disease, and possibly death. And yet our author would regard these results *in moderation* as evidences of food or force *imparted* to the system, while he would recognize the same results, when extreme, as evidences of a poisonous operation on the system. He is wrong in both cases.

Internally administered, then, these two venomous viruses, Alcohol and rattlesnake, operate as nearly alike as twin-fiends, as, indeed, they are; and as unlike bread, or beef, or any other food, as a blister-plaster is unlike a covering of pure wheat flour.

Do not those poisonous insects, called Spanish flies, when applied to the skin or taken into the stomach, occasion the same manifestation of force that Alcohol does, only a little more energetically? Each is a powerful stimulant or irritant. Each occasions vigorous action and a great degree of warmth. Why, then, is not "emplastrum vesicatoria" or "tinctura cantharides" excellent *blistering* foods? Their employment is followed by exactly the same consequences, and they induce precisely the same *diagnosis*—redness, heat, pain, swelling—the same inflammation, the same disease, the same destruction of tissue, the same effort to expel an enemy, the same vital resistance, the same expenditure of vital power as in the case of Alcohol, only more violently and rapidly. Why, then,

Alcohol not a Substitute for Food—Excessive Alimentation.

are not Spanish flies, and all other inflaming and blistering insects, better "force-food" than sugar, starch, flesh, or even Alcohol?

DOES ALCOHOL SAVE THE TISSUE?

"But Alcohol," says our author, "saves the tissue." "Those who drink liquor eat less *other* food than those who do not." This last clause may be true, as a matter of fact, but it does not help our author's philosophy at all.

It is the concurrent opinion of all authors, of whom I have any knowledge, who have made physiology, in its application to dietetics, a subject of special investigation, that the great majority of people in civilized countries eat twice as much as they need.

Excessive alimentation is in truth more destructive to life, as a general rule, than a moderate use of liquor; indeed, gluttony is even more fatal to longevity than drunkenness; yet both are great evils. But this use of Alcohol in one case, and this abuse of food in the other, does not make Alcohol food, nor food poisonous. It proves excessive eating injurious, and leaves Alcohol a poison still.

It is a common remark, and doubtless a true one, that a drunkard has many a time lived to old age, but a glutton never.

I am willing to admit, and, indeed, I verily believe, that excessive and improper eating produces as many and grave evils to the human family as does the use of intoxicating drink; and I believe society needs reform eating societies just as much as it does reform drinking associations. I am willing to go even farther, and admit (for I believe it to be true) that improper or unphysiological habits of eating are the producing causes of the appetite or desire for strong drink, and for all unwholesome beverages. I am willing to admit even (for I believe it), that if mankind were to eat only such food as is best for them, they would never need any drink

Lame and Impotent Logic—Liebig Controverted.

except water, and but very little of this. But this abuse of a good thing does not justify the use of a bad thing, any more than the prodigal employment of money would make stealing right.

Our author is as “lame and impotent” in the premises of his dietetic philosophy as in his physiology. He assumes just what all men of observation know to be false, viz., that people do, at least generally, eat precisely the proper quantities and qualities of food. He entirely ignores the fact, that when persons leave off drinking liquor (as is the case when they abandon any stimulating liquors, foods, or condiments to which they have been accustomed), they feel for a considerable time (longer as the organism is more depraved by them) a longing or craving, which they are very apt to satiate by excessive eating.

Our author quotes Liebig: “Alcohol stands high as a respiratory material. Its use enables us to dispense with starch and sugar in our food,” and then asks, in seeming triumph: “Is more wanted to show that Alcohol is food?”

We could offset that summary style of argumentation by a similar flourish of logic. Youmans (just as good authority in chemistry as Liebig) says: “Alcohol stands high as a toxicological material. Its use diminishes the capacity of the digestive organs to convert food into tissue.” Is more wanted to show that Alcohol is essentially poisonous?

“Are not all physiologists agreed in considering respiratory materials as food?” Suppose they are; they are not all agreed in considering *Alcohol* a respiratory material. Alcohol is no more a respiratory food than Epsom salts are a tissue-forming food. Alcohol is no more used in the lungs than Epsom salts are used in the bowels. Alcohol is cast out, got rid of (in part) through the lungs, because that organ is one of the most convenient emunctories through which to expel it, on precisely the same principle that Epsom salts are got rid of or expelled through the bowels, because the system can

Absurdity of the Whole Doctrine of Respiratory Food.

most conveniently get rid of them in that direction. We might with the same propriety call Epsom salts respiratory food, because there is force displayed (expended) in forcing them violently out of the system, *à la catharsis*, as to call Alcohol respiratory food, because the system ejects it through the lungs. And we might with exactly the same propriety call ipecac, and opium, and camphor, and boneset, and ginger tea, and gin schnapps respiratory food, because the system casts them out through the cutaneous emunctory, *à la diaphoresis*. And we might just as well call niter, cream of tartar, pumpkin seed infusion, silkweed, Indian hemp, queen of the meadow, juniper, uva ursi, and turpentine respiratory food, because the system deterges them mainly off through the kidneys, *à la diuresis*. And we might consider calomel, jalap, gamboge, colycynth, blue-pill mass, mandrake, and marsh miasms respiratory food, because the liver filters them out of the blood or casts out its secretion in self-defense, *à la colagogue*. And we might on the same ground regard tartar emetic, sulphate of zinc, blue vitriol, blood-root, lobelia, tobacco, and warm water respiratory food, because the stomach rejects them, *à la emesis*. And we might in the same way put down chloride of gold, sub-sulphate of mercury, arasabacca, burnt alum, powdered charcoal, pulverized glass, common snuff, and Broadway dust as respiratory food, because of the force which the system exerts (expends) to expel them, *à la sialagogue* and *à la sternutation*.

And lastly, we might with equal propriety call all the classes of tonic, stimulant, nervine, and narcotic medicines, as quinine, capsicum, henbane, chloroform, etc., respiratory food, because whenever they are taken there is a greater manifestation of force; and as "food is force," so force *must be* food; and as these agents and all other poisons under the sun elicit force, so every thing is food, and there is no such thing as an "essential" poison.

Absurd as is this conclusion, it results legitimately and in-

The Arsenical Argument—Fundamental Absurdity.

evitably from the premises ; it is that of the Westminster Review. This inference is inevitable from the author's reasoning ; but he has relieved me from the necessity of further deducing the inference, for he has directly affirmed it.

“ We seize horrible arsenic and drag it into the discussion. It is not a natural indispensable adjunct to human aliment. It is a poison, the qualities of which, as a destructive agent, are familiar enough. Nevertheless, it is certain that even arsenic, so fatal in large doses, actually gives both to horses and men increased vigor, increased beauty, and an enviable rejuvenescence, when taken regularly in minute doses. In Styria it is an article of regular consumption.”

Then it is “ certain ” that arsenic “ *gives* ” vigor, beauty, and youth to men and horses ! Was ever delusion more complete ? And yet the statement that arsenic, a deadly poison in large doses, can, in small doses, impart to us the very quintessence of vitality, preposterous as the proposition is, is nevertheless a natural and legitimate conclusion from the author's premises.

We will turn this arsenic argument against our adversary. The reader will not fail to notice that, as a food, he places it exactly in the same relation to the organism that he does Alcohol. But he does not intimate whether he means to have it understood as a respiratory element of nutrition, or as a tissue-forming material.

Here is a difficulty. Arsenic does not contain any of the elements of nutrition convertible into tissue (the nitrogenous compounds of Liebig), nor has it any hydro-carbon—or combustible material—like Alcohol. There does not seem to be any explainable method in which it can either warm up the system or supply tissue, conditions, according to the author, essential to the nature of food. And yet he does make arsenic to *nourish*, *sustain*, and *invigorate* the body even better than any kind of food ever heard of, not excepting Liebig's high-standing respiratory material, Alcohol.

Historical Data Concerning the Arsenic-Eaters.

The argument has two errors; one of proving too much, and the other of being inconsistent with itself. There must be some mystery or some grand mistake about the matter. Let us see if we can not solve the one or divine the other.

Let us, in the first place, have all the facts bearing on the explanation, and for them let us go to the history of these arsenic-eating Styrians.

The following article, which went the rounds of the newspapers a year or two ago, will present the whole subject fairly before us :

White arsenic, as is well known, is a violent poison. In large doses it is what in medical language is called an irritant poison, but in very minute doses it is known by professional men to be tonic and alterative. It is rarely administered as a medicine, however, by regularly educated practitioners, except, perhaps, in homeopathic practice, and is never used as a household medicine by the people of this country.

THE ARSENIC-EATERS.

In some parts of Lower Austria, however, and Styria, and especially in the hilly region toward Hungary, there prevails among the peasantry an extraordinary custom of eating arsenic. The common people obtain it, under the name of *Hidri*, from itinerant herbalists and peddlers, who bring it from the chimneys of the smelting-houses in the mining regions. Large quantities of arsenic are sublimed during the roasting of the ores of lead and copper, and deposited in the long horizontal or inclined chimneys which are attached to the furnaces in which this operation is carried on. The practice is one which appears to be of considerable antiquity, is continued often throughout a long life, and is even handed down hereditarily from father to son.

It is eaten professedly for one or both of two purposes. *First*, that the eater may thereby acquire freshness of complexion and plumpness of figure. For this purpose, as will readily be supposed, it is chiefly eaten by the young. *Second*, that the wind may be improved, so that long and steep heights may be climbed without difficulty of breathing. By the middle-aged and the old it is esteemed for this influence, and both results are described as following almost invariably from the use of arsenic.

To improve their appearance, young peasants, of both sexes, have recourse to it, some, no doubt, from vanity, and some with the view of

Blooming and Healthy Appearance of Arsenic-Eaters.

adding to their charms in the eyes of each other. And it is very remarkable to see how wonderfully well they attain their object; for these young poison-eaters are generally remarkable for blooming complexions, and a full, rounded, healthy appearance. Dr. Von Tschudi gives the following case as having occurred in his own practice: "A healthy but pale and thin milkmaid, residing in the parish of H——, had a lover whom she wished to attach to herself by a more agreeable exterior. She therefore had recourse to the well-known beautifier, and took arsenic several times a week. The desired effect was not long in showing itself, for in a few months she became stout, rosy-cheeked, and all that her lover could desire. In order, however, to increase the effect, she incautiously increased the dose of arsenic, and fell a victim to her vanity. She died poisoned—a very painful death!" The number of such fatal cases, especially among young persons, is described as by no means inconsiderable.

For the second purpose—that of rendering the breathing easier when going up-hill—the peasant puts a small fragment of arsenic into his mouth, and lets it dissolve. The effect is astonishing. He ascends heights with facility which he could not otherwise do without the greatest difficulty of breathing.

The quantity of arsenic with which the eaters begin is about half a grain. They continue to take this quantity two or three times a week, in the morning fasting, till they become habituated to it. They then cautiously increase the dose as the quantity previously taken seems to diminish in its effects. "The peasant R——," says Dr. Von Tschudi, "a hale man of sixty, who enjoys capital health at present, takes for every dose a piece about two grains in weight. For the last forty years he has continued the habit, which he inherited from his father, and which he will transmit to his children."

No symptoms of illness or of chronic poisoning are observable in any of these arsenic-eaters, when the dose is carefully adapted to the constitution and habit of body of the person using it. But if from any cause the arsenic be left off for a time, symptoms of disease occur which resemble those of slight arsenical poisoning; especially a great feeling of discomfort arises, great indifference to every thing around, anxiety about his own person, deranged digestion, loss of appetite, a feeling of overloading in the stomach, increased flow of saliva, burning from the stomach up to the throat, spasms in the throat, pains in the bowels, constipation, and especially oppression in breathing. From these symptoms there is only one speedy mode of relief—an immediate return to arsenic eating!

This custom does not amount to a passion, like opium eating in the

Arsenic becoming a Necessity of Life—Also given to Horses.

East, betel chewing in India, or cocoa chewing in Peru. The arsenic is not taken as a direct pleasure-giver or happiness-bestower, but the practice, once begun, creates a craving, as the other practices do, and becomes a *necessity of life*.

In Vienna, arsenic is said to be very extensively used for producing the same effects upon horses, especially among gentlemen's grooms and coachmen. They either sprinkle a pinch of it among the oats, or they tie a piece as big as a pea in a bit of linen, and fasten it to the bit when the bridle is put into the horse's mouth. There it is gradually dissolved by the saliva, and swallowed. The sleek, round, glossy appearance of many of the first-rate coach-horses, and especially the foaming at the mouth, which is so much admired, is owing to the arsenic they get. In mountainous districts, also, where horses have to drag heavy burdens up steep places, the drivers often put a dose of arsenic into the last portion of food they give them. This practice is continued for years without the least injury. But if a horse which is used to it comes into the possession of one who does not give arsenic, it loses health and spirits, becomes weak, and the most nutritious food is found unable to restore the animal to its former appearance.

Though a substance so very different in kind from all the narcotics we have described, yet the effects which result from the eating of arsenic in the way just mentioned have a remarkable resemblance to those which some of the narcotics produce. Thus arsenic resembles cocoa in making the food appear to go farther, or to have more effect in feeding or fattening the body, while, like cocoa also, it gives the remarkable power of climbing hills without breathlessness. And further, it resembles both cocoa and opium, and especially the latter, in creating a diseased and uncomfortable craving, and in thus becoming, through long use, a necessity of life.

The chemico-physiological action of arsenic, in producing these curious effects, has not as yet been experimentally investigated. From the nature of the results, we think it probable that, when experiments come to be made, they will show that the quantity of carbonic acid given off by the lungs is diminished by the use of this drug. The effects of this, supposing it to be the case, are, *first*, that less oxygen is required to be inhaled, and hence the greater ease of breathing under all circumstances, but which is especially perceived in climbing hills; and *second*, that the fat of the food which would otherwise have been used up in supplying carbonic acid to be given off by the lungs, is deposited instead in the cellular tissue beneath the skin, and thus pads, plumps out, and renders fair the animal that uses it.

But in whatever way the physiological effects are produced, their

Poisonous Love-Philters and Potions—Fatal Results.

existence appears to be beyond dispute; and the perusal of them can scarcely fail to recall to our minds the dreamy recollections of what we have been accustomed to consider as the foolish fancies of easy and credulous times. Love-philters, charms, and potions start up again as real things beneath the burning light of progressive science. From the influence of hemp and arsenic no heart seems secure; by their assistance, no affection unattainable. The wise woman whom the charmless female of the East consults, administers to the desired one a philter, which deceives his imagination, cheats him into the belief that charms and attractive beauty exist where there are none, and defrauds him of a love which, with the truth before him, he would never have yielded. She acts directly upon his brain with her hempen potion, leaving the unlovely object he is to admire all unlovely as before. It is a case of odyllic moonshine!

But the Styrian peasant girl, stirred by an unconsciously growing attachment, confiding scarcely to herself her secret feelings, and taking counsel only of her inherited wisdom, really adds to the natural graces of her filling and rounding form, paints with brighter hues her blushing cheeks and tempting lips, and imparts a new and winning luster to her sparkling eyes. Every one sees and admires the reality of her growing beauty; the young men sound her praises and become suppliants for her favor. She triumphs over the affections of all, and compels the chosen one to her feet.

And dost thou, too, cruel arsenic—so often the minister of crime and the parent of sorrow—dost thou, too, bear a blessed jewel in thy forehead; and, as a love-philter, canst thou really become the harbinger of happiness, the soother of ardent longings, the bestower of contentment and peace?

It is probable that the use of these and many other love-potions has been known to the initiated from very early times; now given to the female to enhance her real charms, now administered to the lords of the creation to lend imaginary beauties to the unattractive. And out of this use must often have sprung fatal results to the female, as is now sometimes the case in Styria, from the incautious use of the poisonous drug; to the male, as happens daily in the East, from the maddening effects of the fiery hemp. They must also have given birth to hidden crimes, which only romance now collects and preserves—the ignorance of the learned having long ago pronounced them unworthy of belief!

The intelligent and careful reader will observe the close analogy between the effects of arsenic and those of opium,

All Poisons may become "Necessities of Life"—And may Fatten Animals.

tobacco, and other poisonous irritants, which are used habitually and between the effects of all of these and those of Alcohol in all its forms. Either one may become a "necessity of life" as well as another, and all be equally and essentially poisonous.

"Millions have died that Cæsar might be great."

Millions of human beings have died prematurely, and tens of thousands are dying every year, because the *manner* in which arsenic, Alcohol, and other poisons, occasions the manifestations of "increased vigor," "beauty," "rejuvenescence," etc., was not and is not understood; because the *rationale* was not correctly explained by the medical profession. The people of the civilized world would stand aghast with horror if their eyes could be at once opened, and they could see all the sickness and death, all the ruin and desolation, consequent on this error, trivial as it may seem in theory.

No one will pretend that the minute quantities of arsenic taken into the system—a quarter of a grain up to two grains—can supply any appreciable *quantity* of nutriment; nor is there any element of nutrition in it to be supplied; it can not give or impart what it does not possess. It is not combustible, and if it were, its combustion, so far as warming the system, or respiratory food, is concerned, would be utterly insignificant in view of the fact that oxygen, nitrogen, hydrogen, carbon, and sugar, starch, gum, gluten, fibrin, albumen, etc.—elements of both tissue-forming and respiratory food—are ordinarily taken into the system at the rate of gallons and pounds per day.

Surely the extraordinary power of arsenic to fatten the individual can not result from any nutritive element, nor any element of force it imparts to the system. We must seek for some other principle of explanation.

Now almost all poisons may be so used as to fatten animals, and also in such a manner as to occasion an extraordi-

Rationale of Fattening Animals with Poisons.

nary manifestation of vitality. But mark! *The vitality is manifested in its expenditure*, not in its acquisition or accumulation; and poisons occasion this *apparent vigor* of the organism just because they *are* poisons. The vigor is that of vital resistance; the "beauty" is that of a consuming fever; the "plumpness" is the plethora of defective depuration, and the "rejuvenescence" is the rapid expenditure of that unreplenishable fund of life which ought to have been saved for functional duties in the distant future. To induce "rejuvenescence" by arsenic or Alcohol, is simply to cause a person to wear out and die in one half or one quarter the time nature intended.

Antimony ranks, with arsenic and Alcohol, among the most deadly poisons; yet antimony is used to fatten horses, hogs, and other animals, and may be so employed as to fatten a human creature. How are these things to be explained?

Not on the principle of food, force, vigor, beauty, rejuvenescence, etc., *supplied* to the system, but on the principle of substance, force, vigor, or vitality *expended from the organism*; in other words, on the principle of vital resistance to incompatible substances.

Let us see if this principle will not satisfactorily account for all the mysterious phenomena and delusive appearances resulting from the administration or use of Alcohol, arsenic, opium, tobacco, and all other things essentially poisonous.

To understand this whole subject, we must ever bear in mind one grand fundamental principle, which I will now attempt, very briefly, to elucidate:

THE RELATIONS OF LIVING AND INORGANIC MATTER.

Vitality is the distinguishing property of *living* matter. In the human organism there are three leading structures or tissues, each having its own distinctive vital property. These tissues are the *muscular*, whose vital property is *contractility*; the *nerves of the brain*, whose vital property is *sensibility*;

Vital Properties and Structures—Their Distinctions.

and the *nerves of organic life*, whose vital property is *irritability*. These properties may be expressed in *action*, *feeling*, and *perceptivity*, which together constitute vitality. The “vital principle,” the “*vis conservatrix naturæ*,” the “remedial power of nature”—common phrases in medical and physiological writings—mean simply the aggregate of vital properties.

The function of the organic nervous system is to preside over the growth and development of the body; to carry on circulation, respiration, digestion, secretion, etc.; to perceive what is useful as food, and to recognize what is injurious as poison. The organic nerves are often spoken of as the “organic sensibilities,” the “vital instincts,” etc. They recognize things in contact with the body.

The function of the mental nervous system is to recognize things external to and distinct from the body; to connect us with surrounding nature.

The function of the muscular system is to execute the mandates of the different nervous systems. The muscles contract, act, move, and are thus the instruments of sensation, of mind, and of organic perception.

When the things of the inanimate world are brought in contact with the sensitive surface of the living system, or taken into the interior, action, motion, and change take place; circulation, temperature, secretion, sensibility, etc., in the part are increased or diminished. It is common to say that these effects result from the action of the thing on the system; and this is the common doctrine of medical men. But it is a lamentable mistake. The action is always and solely on the part of the vital machinery, for it is this power to act which alone distinguishes vital or living from non-vital or dead matter.

A living being, an animal, can transform other forms of matter into its own structure, and then resolve them into their original elements without itself undergoing transformation or change. Dead and inorganic matter is only capable of chem-

ical accretion or separation, and mechanical admixture. In chemical changes all the substances in contact are changed. They lose their identity, and unite or separate to form substances different from either of the ingredients. In vital changes or processes the organized being changes other things, but preserves its own identity.

Living matter has the power, to a certain extent, of self-preservation, otherwise it could not be distinguished from dead. It can appropriate nutrient materials, and it can reject and expel foreign or incompatible materials, otherwise it could have no power of self-preservation. We see, then, how those philosophers are forever misled, who place the action in Alcohol or arsenic, instead of in the living system, when they are brought in contact.

Let us apply these data to the subject in hand. The living system acts on food by mastication, insalivation, digestion, chylification, arterialization, etc., to convert it into itself. The living system also acts upon or against poisons, extraneous substances, by vomiting, purging, sweating, transudation, etc., to expel them from the body. One set of processes may be called nutritive or formative; the other set of processes are preservative or depurative.

It is unphilosophical to say that food *stimulates* the stomach, light *acts* on the eyes, calomel *acts* on the liver, opium *acts* on the brain; Alcohol *imparts* force, arsenic *gives* strength, water *stimulates* the skin, jalap *acts* on the bowels, etc. The true doctrine is the reverse of all this. The stomach *recognizes* and acts upon food; the eye *takes cognizance* of objects through the medium of light; the liver *resists* calomel by pouring out its secretion; the brain is *torpid* when all the vital energies are employed in a struggle against opium in the stomach; the body is *feverish* when the vital powers are warring against Alcohol; the circulation is *increased* when an effort is making to expel arsenic from the system; the skin is *red* after a bath because the blood goes to the sur-

Rationale of Particular Medicines Acting on Particular Parts.

face in defense of the organism ; and the bowels are inordinately *active* because they are expelling the jalap, etc.

Medical authors tell us that particular medicines operate or act on particular organs because they have a special affinity for those organs, as ipecac on the stomach, castor-oil on the bowels, squills on the lungs, etc. This is all nonsense. These several effects, as they are called, merely indicate the manner in which the living system can best rid itself of their presence.

I have alluded to certain processes on the part of the living system which occur in relation to food, and other processes which occur in relation to poisons. Now which set of processes are called into operation when arsenic, opium, tobacco, or Alcohol is taken into the system ? Most clearly the latter.

But how does a poison fatten ? To fatten animals by the use of poisons, they must be given in what are called, in medical parlance, *very small doses*. Large doses would provoke so powerful vital resistance that severe and painful inflammation or fever would supervene, and the injurious thing be expelled by vomiting or purging; or that violent struggle in the central domain of vitality which would rapidly emaciate the patient. But if very small quantities are taken, the vital resistance is more gradual and prolonged.

It is a law of the animal economy recognized by all philosophers and physiologists, that all morbid agents, whether effete material of the tissues or poisons, are expelled from the system through the outlet and in the manner producing the least disturbance, the least "wear and tear" of the organism. Thus small doses of opium, calomel, Alcohol, arsenic, antimony, etc., are expelled through the skin and lungs ; niter, turpentine, salts, and alkalies through the kidneys, etc.

Several classes of medicines (in small doses) are expelled through the lungs and skin in so quiet a manner, that we only notice an increased action generally of the nervous and cir-

How Poisons Fatten Animals—Obesity a Disease.

culating systems. This is the case with all medicinal agents called tonics, stimulants, nervines, and narcotics, as quinine, arsenic, opium, camphor, musk, castor, chloroform, Alcohol, tobacco, henbane, belladonna, aconite, etc. This increased action, the Westminster Review, in common with too many of the medical profession, has mistaken for increased energy. It is energy *expended* in self-defense, not energy *acquired*. It is like unto the energy displayed in and around Sebastopol, which is exhausting rapidly the resources of the warring nations.

But give these same agents in larger, or in what are called *full medicinal doses*, what then do we discover? There is vital resistance proportioned to the dose and the danger. Instead of being thrown off gently through the respiratory and perspiratory processes, they are vigorously resisted in the first passages; and we have a violent commotion—pain, heat, inflammation, fever, nausea, vomiting, etc., etc.

But still the question recurs, *How* does a poison fatten an animal? I am now prepared to answer directly; not by imparting nutrition, nor force, nor force material, but by *lessening depuration*. The outlets are clogged up; the excretory function is debilitated; the adipose (effete) material is not consumed *as it should be*, and accumulates in the areolar tissue; the body is in a state of congestion, plethora, disease; a fattened animal or person is in a diseased condition.

All persons seem to understand well enough that emaciation, great leanness of body, as in cases of dyspepsia, marasmus, consumption, etc., are morbid conditions; but many of them have made the singular mistake that the opposite extreme, over-fullness, obstruction, obesity, etc., indicates high health! Either deviation from the balance of assimilation and depuration is as much a diseased state as the other.

The processes usually employed to fatten animals do not “aid and assist digestion” so much as they check or retard purification. They aim to prevent the rapid metamorphosis

Fattening Processes retard Metamorphosis—Fatness opposed to Strength.

of tissue ; to lessen vital force in the direction of the excretions ; to retard the oxydation or burning up of waste and effete matters, and thus favor their accumulation in the cellular structure.

When it is desired to make geese, turkeys, hogs, etc., *very fat*, they are confined in dark, warm places, and fed on sloppy mixed dishes. Under this regimen their flesh grows soft and flabby, the areolar tissue becomes distended with fat, the liver large and greasy, and the whole carcass putrescent. The animal grows fat, not because it is *over-nourished*, but because it is *under-depurated*. The animal also grows weaker as it grows fatter, which fact alone proves that the mere carrying of an oppressive burden is something very different from force, food, or strength. The animal has not available force enough to throw off the superfluous matters ; but as they can not remain in the blood-vessels without obstructing their channels and inducing immediate death, they are, as nature's best expedient to prolong existence, temporarily deposited in the cells and cavities of the body.

If any one wishes to test the principle I am contending for conclusively, he has but to ask a very fat man or a very fat animal to work. A little active exertion soon overcomes him. He pants, and trembles, and sweats, and gives out ; whereas the lean person or animal will perform the same labor with no apparent distress or inconvenience.

When a poison is taken into the stomach, a disproportionate amount of vitality is determined there. Where the enemy is first recognized is, of course, the place where the vital energies must expend themselves in warring against it. So long as the poison is continued, so long is the general system deprived of its due portion and proportion of vital power, because of the war and the waste in the region of the stomach. And this explanation abundantly accounts for the fact, which all men of observation agree in, and which all medical authors of respectability affirm, viz., that the prolonged use of tonics,

Tonics and Stimulants Debilitate—The Principle Illustrated.

stimulants, etc., of whatever kind, though apparently strengthening at first, invariably occasions debility in the end.

The philosophy of this subject may be well illustrated by that of the Crimean campaign. There is great manifestation of life, energy, activity, and vitality in and around Sebastopol. But is there not proportionate disease and death? Are not the "sinews of war," the "life-blood of the nations," the "resources of the people," there and elsewhere, being expended all the while, and with a rapidity and prodigality exactly proportionate to the energy of action?

The people of Styria soon get addicted to the peculiar "energy of action" consequent on the presence of arsenic in the stomach, and, like the brandy toper, or the tobacco sot, or the opium user, can not do without it. And so of a hundred other injurious or poisonous things.

But this does not reverse the order of nature; it only *disorders* a part of it. It does not alter the relation of a poison to the vital machinery. It only shows to what extent the organism can be perverted before it is utterly and irremediably destroyed.

Many a person has become so addicted to the titillation of a little pinch of tobacco-dust, in the shape of snuff, that a sniff of it two or three times a day seems to be a necessity of existence. With its use he feels tolerably comfortable, while without it he would be extremely miserable. But will any one argue from this that snuff is respiratory food, or a force-giving material, or that it is not essentially poisonous?

According to the Westminster Review, we have but to indulge in unphysiological habits to reverse all the laws and all the order of the universe. We have but to violate the laws of life, and, *presto*, they are all changed or annihilated! It is much better for us to understand that, if we break the laws, the laws will remain the same, but *we shall be changed*; the laws are the same "yesterday, to-day, and forever," but we who transgress them will surely suffer the penalty. Instead

Pleasures of Liquor-Drinking contrasted with its Pains.

of misleading our fellow-creatures into infractions of the laws of their own being, whereby suffering, and misery, and premature death are inevitable, how much more God-like and glorious to teach them obedience in all the multitudinous relations of their existence, so that “a sound mind in a healthy body,” with length of days and permanent happiness, may be their destiny.

THE PLEASURE OF LIQUOR-DRINKING.

But, says our author, we must take the *pleasure* into the account. Yea, verily. And suppose we counterbalance the pleasure on one side with the *pain* on the other! Will not the contrast be very much like a contrast between pleasure and pain in a mob, in a mad-house, in pandemonium, in and around Sebastopol? Some persons can, indeed, get sensuous gratification for a moment in some relations of their organism, at the sacrifice of all the rest of their being, and at the terrible expense of all that is great in man or good in society.

The wine-bibber says that his bottle makes him realize pleasurable sensations; and the tobacco-user experiences a very agreeable exhilaration; and the arsenic-eater finds “new graces” developed; and the gouty epicure finds the cravings of a morbid appetite assuaged in the “riotous eating” of half-putrescent flesh. Yet how do these “pleasure-seekers” seem to others whose appetences and whose minds are not under the dominion of acquired habits? Let those who have once experienced the curse of perverted instincts, and then redeemed their sensibilities by a return to truth and nature, answer this question.

All these things prove nothing more nor less than that such persons as seem to enjoy the use of these depraving poisons have lost the natural appetences, and so far lost the power of appreciating what God and nature intended for their ample satisfaction and continuous enjoyment.

To the undrugged sense there is greater pleasure—far

How Poison occasions Pleasure—Rationale of Pleasure and Pain.

greater—in the drinking of water than of wine. To prove this we have only to present a draught of each to a normal taste. One stings, burns, and inflames, according to its alcoholic strength; the other refreshes, satisfies, and soothes, according to its purity.

But how is it that the organism experiences pleasure under the operation of a poison? Here is the great mystery that has misled the world for at least four thousand years. Let us see if we can not clear it up, for without a solution of this problem our understanding of the relations of Alcohol to the human organism will be incomplete.

We must inquire, firstly, how is pleasure occasioned at all? What is pleasure? What is the rationale of what we call pleasure, and of its opposite, pain? These questions must be answered before we can elucidate the main proposition.

Pleasure is agreeable sensation. Disagreeable sensation is called pain. Sensation is the recognition or perception of a functional action by the brain or mind. Action, then—exercise—is essential to either pleasure or pain. Pleasure in an organ or part results from its normal action, or its balanced or nearly balanced action with the organs or parts of the system generally. Pain results from the abnormal action of a part or organ, or from its greatly unbalanced action in relation to other parts or organs. *Pleasure*, or *agreeable sensation*, relates specifically to such actions as are concerned in the ordinary operations and uses of the organic machinery, in the adaptation of hygienic agencies, as air, light, water, food, temperature, exercise, etc., to the maintenance of the structures and their relations to external objects. *Pain*, or *irritation*, relates specifically to the defense of the system from morbific influences and the expulsion of injurious materials, as Alcohol, arsenic, mercury, antimony, etc.

On these premises we can meet and solve the difficulty. To make the illustration clear and readily comprehensible, let us take the smallest quantity of any one of the poisons I have

Modus Operandi of Poisons Demonstrated.

named, the effects of which we can appreciate, and gradually increase the dose till disease and death result, and see whether all the phenomena are not explicable, and explicable only on the hypothesis that Alcohol *is* a poison essentially, and that it is injurious according to quantity, and under all circumstances.

A few teaspoonfuls of wine or brandy (more or less, as the person is or is not accustomed to stimulus), mixed with water and sugar, and taken into the stomach, occasion a pleasurable glow, a moderate sensation of warmth is diffused throughout the system, the circulation is somewhat increased, the general surface of the body is very slightly flushed, and the brain and nervous system feel an unwonted energy. Why all this?

Because the vital instincts have recognized an enemy within. From all points of the vital domain they are gathering their forces to resist and expel it. Does any thing like this happen when food is taken? Not at all.

Yet the enemy is not formidable. It is not present in sufficient dose to endanger life immediately. The *vis conservatrix naturæ*, which all philosophers of all ages have recognized and acknowledged as the "true physician," causes the mucous membrane to pour out its secretion and *dilute the adversary*; it is then carried along (it does not *go*, but is *carried*) to the absorbents, taken up by them and conveyed into the mass of blood, and thence expelled (*consumed, oxydated, burned, decomposed, but not digested*) through the lungs, skin, and other emunctories.

Now this increased action of the whole nervous and circulating systems is not so violent as to disturb materially the balance, the harmony, the "rythm" of functional action. And, as all sensation depends on action, this generally increased action will only induce generally increased sensation; and so long as the general balance of action can be maintained, it is quite manifest that the organism may experience augmented pleasurable sensations, and this as a consequence of the increased action (vital effort) which expels the Alcohol.

Nervine Stimulant and Narcotic Properties of Alcohol Explained.

But is this useful or injurious to the organism? It is not functional duty, and hence can not be useful. It is warfare, and war, in the vital domain as among the nations, is necessarily and essentially a process of waste, expenditure, destruction, and premature decay. Hence the more of *such* pleasure the individual gains, the sooner will his race of pleasure for this world be ended.

Let us carry on the illustration. Increase the dose. Give a moderate drinker a moderate dose. How does he feel now? A little more of the same heat, the glow, a little greater commotion in the organism, a little more stimulated, a little more exhilarated, and a little more pleasurable sensation; because even yet he has not very greatly unbalanced the functional effort. All the vital instincts are still acting in one direction to eject the poison through the lungs, and skin, etc.

Let us go on. Double the dose. Now what? He is not only more exhilarated, but a little dizzy; the dose is too large to be so safely transported through the system, hence it meets a more violent resistance in the stomach; this violent action there unbalances the circulation; the patient (for the victim of our experimentation is now sick really) feels more irritation than sensation, more pain than pleasure. Before, he was under what is called the *nervine* influence of the drug; now, he is under its *stimulant* operation. Then, he felt "kind o' agreeable," "sort o' happy," contented, pleased, placid, and wonderfully clever, if not positively silly. Now, he is fretful, uneasy, unhappy, pugnacious, disposed to wrangle, and willing to fight. Does "respiratory food" ever operate in this way, even in ever so large quantities?

Let us finish the experiment, if we do not finish the patient by the experiment. Double the dose again. The individual is crazy, tremulous, stinging with inflammation or burning with fever, and soon becomes stupidly apoplectic. He is under what is called the *narcotic* property of the Alcohol. Would any amount of any kind of nutritive elements produce effects

Rationale of Effects of Different Doses—Medical Authorities.

in the least resembling these? Would sugar or starch, though not quite so high in the scale of respiratory food, according to Liebig, as Alcohol, occasion effects in the least analogous?

If our patient should, from the extreme effects of the alcoholic "respiratory food," go into convulsions and die, as often happens; or if he should be roused up deliriously, and in his madness kill his wife or murder his child, as has happened many more times than a thousand, should not the verdict of the coroner's jury be, in the one case, "Death from respiratory food *becoming* poisonous by quantity;" and, in the other case, "Homicide from excess of force, food being force and Alcohol food?"

Do we not now see, plainly enough, why it is that small doses stimulate and exhilarate? and why large doses intoxicate and stupefy? and why all doses are *essentially* poisonous?

Exactly the same illustration may be made with opium, or with tobacco, or with any medicinal agent or drug which reputedly possesses this combination of properties called *nervine*, *stimulant*, and *narcotic*.

MEDICAL AUTHORITIES ON BOTH SIDES.

I am willing to be thankful for small favors; and I am happy in being able to quote even one medical and scientific authority in favor of my main position—an authority which, though not as eminent in station as Liebig, is, at least, as correct in logic. I mean Dr. N. Gilman, of South Deerfield, Mass., who says:

As a stimulant, Alcohol possesses great power, but its usefulness is not proportionate. There is no doubt that a comet possesses wonderful propelling power, still it might be very difficult to make a practical and safe application of that power on a railroad. Take a patient, reduced low by fever, for instance. Look at the state of the system and the condition of the various functions. Apply sound physiological and pathological principles, and ascertain the wants of the system; then look at the properties of Alcohol, and see if it is capable of supplying them.

Testimony of Dr. Gilman—Alcohol as a Medicine in Fevers.

When reduced low by fever, the vital powers are nearly exhausted by the previous excitement and deficient nutrition. Is stimulation indicated? Does the patient need to have another excitement produced in the system, which will make a still greater draft on his latent nervous energies? Does he not rather require perfect rest and suitable nourishment? Undoubtedly; for nothing else can impart *real, permanent* strength, and restore the wasted powers of life. This is so plain that it can be understood by any reflecting person, without any knowledge of physiology. When the mass of the people, who have no medical education, shall get their eyes open, and look into this subject for themselves, some of our learned craft will be ashamed of their own stupidity.

We will next look at Alcohol, and learn its nature; then determine whether it imparts any strength to the body. Alcohol, in all its forms, is a mere *stimulant*; or, rather, with more propriety, it might be called an *irritant poison*, possessing no tonic or strengthening properties whatever. The digestive organs have no power to change it, or extract from it any nourishing principle. Without undergoing any change, except what is produced by dilution, it is taken up by the absorbents, carried into the blood, and goes the rounds of the circulation. Thus every organ and tissue in the body has an irritating poison brought into actual contact with it. This must be expelled without delay, or their vitality is endangered. An additional task is thus imposed upon the vital organs. The apparent increase of strength is nothing more than the latent nervous energies, aroused for the sole purpose of driving out this enemy from the body. When this task is over, there is still greater exhaustion. Nothing has been gained by the operation, but a positive loss has been sustained.

There are two other ways in which the presence of Alcohol in the blood disturbs the vital functions. *First*, it interferes with the nutritive operations. Dr. Carpenter says: "Among the most important of the chemical changes which Alcohol has the power of effecting, is the coagulation of soluble albumen; and although it will rarely, if ever, be introduced into the mass of the blood, or into the serous fluids of the tissues, by any ordinary alcoholic potations, in a sufficiently concentrated state to effect this, yet we should anticipate that its presence, even in a very dilute form, must affect the chemical relations of albumen, and can scarcely do otherwise than retard that peculiar transformation by which it is converted into the more *vitalized* substance, fibrin." That such is actually the case, will be rendered probable by the considerations to be presently adduced.

"No considerable changes of a physical or chemical nature can take place in any of the animal tissues without disordering their *vital* prop-

Influence of Alcohol on the Blood—Changes Arterial to Venous.

erties also; and we have now to inquire into the mode in which these properties are affected by the contact with alcoholic liquids. In the first place, it would appear that the solidifiability of the fibrin, which is its special vital endowment, is impaired by the introduction of Alcohol into the fluid that contains it; for when an animal is killed by the injection of Alcohol into the blood-vessels, the blood often remains fluid after death, or coagulates but imperfectly. Now, as it is probable that nearly all the organized tissues are developed at the expense of fibrin, it is obvious that any thing which impairs its organizability must have an injurious influence upon the general nutritive operations; and we shall hereafter find confirmation of this inference in that peculiar condition of the system which results from excessive habitual indulgence in alcoholic potations, and of which the imperfect elaboration of fibrin is one of the special characteristics."

This quotation needs no comment. It is quite obvious that any medicine, which so decidedly interrupts the restorative process, can not impart strength to the exhausted body.

Secondly. The presence of Alcohol in the blood disturbs the vital functions, by preventing the decarbonization of the blood through the agency of respiration. And here Dr. Carpenter shall speak for us again. "The alcoholic odor of the *breath* is a sufficient indication that alcoholic vapor is exhaled from the lungs in the act of respiration; but the quantity of this is probably small in comparison with that which is carried off in another way, viz., by the combustive process which takes place in the blood at the expense of the oxygen it contains, and which converts the Alcohol into carbonic acid and water; both of which are set free by exhalation from the lungs. The readiness with which Alcohol is thus oxydized, in fact, is probably one cause of its influence in giving a venous aspect to arterial blood; since it will withdraw the oxygen from other substances which are waiting to be eliminated by the combustive process, and the accumulation of which will deteriorate the character of the fluid."

The injury arising from this source is proportionate to the quantity used. In health, no appreciable effect might be produced by the small quantities administered in sickness: yet we may safely infer that when the system is so much prostrated that the lungs can with great difficulty so far purify the blood as to enable it to stimulate the heart and brain to action, a very minute quantity of Alcohol, by imposing an additional task, may cause a fatal result. The physician who prescribes Alcohol under such circumstances, thwarts his own purpose. It has long since been known that it never imparts any *new* strength, but only makes a draft on what one already possesses. As in health, so in sickness, it is

Delusion of Medical Men—Stimulation mistaken for Nutrition.

never capable of affording any other strength than is imparted by the lash to the jaded horse.

This being the case, it would seem to be self-evident that it can, in no case of prostration from fevers, or any other debilitating causes, facilitate recovery. On the contrary, it must hasten death, when the nervous energies are too much exhausted to allow of the recovery without stimulation, and actually *cause* a fatal termination, when the vital powers are barely sufficient to keep up the action of the heart till they can be invigorated by rest and nutrition. It is only in cases where the patient has more strength than he actually *needs*, that it would be safe to stimulate with Alcohol. The physician who prescribes port wine, or any other alcoholic stimulant in such cases, does not understand the difference between stimulation and nutrition, consequently he fails to prescribe scientifically or successfully. A patient thus reduced may be compared to a lamp with the oil so nearly exhausted as to present but a slight flickering blaze. The gentlest motion or breath of air will extinguish it. It will burn for hours if not disturbed; yet, if you pick up the wick, a momentary flame is produced, and then entirely disappears. If you had carefully filled the lamp with oil, the flame would have been *permanently revived*.

So much for theory; now for practice. A person is sick of fever, a crisis takes place at the proper time, the patient is convalescent, and the doctor recommends a little wine to strengthen him: Under its use the patient feels better, an appetite is excited prematurely, and indulged too freely. He grows worse, and is soon apprised by his physician that "he has been imprudent in eating, and caused a relapse of the fever." Another has typhoid fever, is very feeble, and wine is resorted to, for the purpose of keeping up the strength. The vital powers are rallied, and strong hopes are entertained of his recovery. But the next day, perhaps, an inflammation is developed in the brain, lungs, or abdominal viscera, and the symptoms become alarming. The doctor is summoned, and assures the friends that "another fever has set in, and he fears it will go hard with the patient."

It may be laid down as a rule, that if alcoholic liquors relieve, or seem to cure one disease, they cause some other, as bad or worse. The pleasurable feelings resulting from the stimulation lull all suspicion of the mischief going on, which is usually referred to the patient having "taken cold or eaten something to hurt him," or, as not unfrequently happens, that modern scapegoat, *calomel*, is obliged to bear away all the sin and reproach of this deleterious article. The necessity of stimulants, in such cases, is not so great as is generally supposed. The patient is not always dying when the pulse becomes very feeble and intermittent.

Alcohol in the Marine Hospital—Remarks of Mr. Cumming.

This is no very uncommon occurrence when the excitement of fever is gone. If there are latent nervous energies, nature will call them into action; if there are none, stimulants will have no effect. I would not take the responsibility of deciding the point whether stimulants of any kind are ever beneficial in these cases; but I do venture the opinion, that if necessary, we have at our command many articles of that kind which should have the preference to Alcohol. Of this character are ammonia, oil of peppermint and spearmint, ginger, Cayenne pepper, serpentaria, etc. Some of these act simply upon the *primæ viæ* as stimulants, and by sympathy upon the brain, heart, and other vital organs. If we can give the desired impulse to the heart, brain, and nervous system without subjecting these organs to the poisonous contact of Alcohol, much is gained.

Pertinent to this subject, and as a remarkable example of well-told “Common Sense *versus* Science,” I can not forbear placing on record in this place the remarks of John P. Cumming, Esq., recently made at a meeting of the Board of Commissioners of Emigration:

THE USE OF LIQUOR AS A MEDICINE.

Mr. Cumming, from the Committee on Marine Hospital, presented the following:

The undersigned, a minority of the “Committee for Purchases,” to whom was referred the communication from Dr. Harris, asking for five gallons each of pure brandy and wine for the Marine Hospital, respectfully gives the following as the reasons why he dissents from the views of the majority report of the Committee on that subject:

First.—I consider the use of poisons for the purpose of restoring health to the sick as one of the grossest absurdities ever devised.

Second.—I consider the use of alcoholic poison one of the most mischievous and deadly both to the bodies and minds of those who use it, either as a beverage or as a medicine; that so far from aiding in the recovery of health, it is one of the most destructive agencies to health.

Third.—I consider that the use of alcoholic poison as an article of drink or medicine is a powerful means of inducing habits of intemperance, and of awakening that insane appetite for this poison in those who have been formerly addicted to drunkenness.

Fourth.—From all the evidences that I have been able to obtain in regard to the use of alcoholic poison as medicine, it is to me apparent that the best and most reputed physicians are abandoning its use. In

Hygienic Treatment of Disease *vs.* Drugs.

one school of medicine, which uses only such remedies as are known to be healthful in their character, and denounces as absurd and ridiculous the use of all poisons whatsoever, total abstinence from this poison is required as an indispensable prerequisite in their treatment. This plan of curing disease by means of healthy agencies instead of destructive poisons is one of the most successful in use. It accords with common sense, reason, and the laws of life and health so far as understood. A large proportion of the physicians practicing this system have been regularly instructed in the poisoning system of treating disease, and having abandoned it with deserved disgust and contempt, limit themselves to the employment of such means only as they know will favor health and life, instead of those whose natural tendencies are to destroy them.

Some of the most eminent physicians and physiologists of the age belong to what is termed the Hydropathic system of medicine. This system of treating disease consists, as stated by them, in the use of light, water, air, temperature, exercise, food, etc., to the exclusion of all poisonous and life-destroying agencies whatsoever.

Holding such views in regard to the use of alcoholic poisons, I have been compelled to dissent from the Committee in the report and recommendations thereto appended. And as the Committee have lengthily embodied in their report the reasons for adopting its recommendation, I will advert briefly to those reasons, stating why I considered them unsatisfactory and unreasonable.

The reasons assigned in the report are as follows:

“ 1. That the physician whose business it is to attend to the sick, and who, it must be presumed, is best qualified, from the fact of his profession, of knowing what is necessary and best adapted to cure disease, has required it for such purpose.

“ 2. That it is absurd in such cases for the Committee, whose members are not physicians, to sit in judgment on persons who have devoted themselves exclusively to the theory and practice of curing disease.

“ 3. That the fact of wine being used in the most solemn religious rites of Christianity, and appointed for that use by the author of the Christian religion, also that the use of wine is recommended for medicinal purposes in the sacred writings, and even for ordinary beverage, affords satisfactory and conclusive evidence of the fanaticism, if not insanity, of those who are opposed to the use of alcoholic stimulants for the purposes specified.”

Before alluding to these reasons by way of reply, I would observe that it appears to me very strange, if they considered it to be of so great importance and so self-evidently obligatory, to yield to professional authority. If they coincided in opinion with the physician in regard to the

Discordant Opinions of Physicians on all Subjects.

necessity of using alcoholic stimulants as a means of curing disease and promoting convalescence, why is it they did not give immediate attention to the requisition as empowered by the Board, without keeping it in their hands for one week? If any of the patients have died for want of alcoholic poisons during this time, it would appear to me a serious matter. This fact compels me to the adoption of the opinion that, after all, the brandy and wine, in their opinion, is not of so great necessity or utility as from its eulogies in the report might reasonably be supposed. From the known humanity and uprightness of those forming the majority of the Committee (to which I can give voluntary testimony), I am persuaded, if they considered the life or convalescence of any of the patients was periled by not having the alcoholic medicines required immediately, they would have acted without any loss of time on the subject; they evidently considered delay in this matter was not dangerous, and that their faith in the great necessity and importance of alcoholic stimulants, for the use required, must have been, during this time at least, most amazingly small. So, I must be allowed to say, the matter has appeared to me. With these preliminary observations I will proceed to advert to the reasons assigned for the recommendations of the resolution appended to their report, and substantiate by proper evidence the reasons assigned by me for withholding my assent to it.

In reply to the argument as to the impropriety of dissenting from the physician respecting the use of alcoholic poisons for the purposes specified, I would observe that I consider every person is under a moral obligation to use his own judgment and follow the dictates of his own reason and conscience in any course of action which he may think well to adopt, either as acting for himself or for others. The practice of yielding implicit obedience in matters of faith and practice to any authority less than divine, in defiance of the dictates of one's own reason and conscience, seems to me to be one of the most absurd and foolish things imaginable. So at least I have been taught, and so I believe; and in accordance with such belief it is my determination always to act. Every man—having a just claim to that title—will make use of *his own reason and his own conscience* in all his actions, and not those of another man. In one case only is there, in my opinion, an exception to be made, viz.: when the individual is conscious of being utterly deficient in intelligence and common sense, and a perfect "Know Nothing" in regard to the subject under consideration. It is a well-known fact to those who know any thing, that the opinions of the best educated physicians are not only different, but are even opposed to each other in regard to the right mode of curing disease. There are as many sects in the medical world as in the Christian. The teachers in both are equally virulent in de-

Bible Argument in Favor of Alcoholic Medicines Criticised.

nouncing as imposture the opinions and practices of those differing from their own. In cases where testimonies are opposite and contradictory, and the witnesses in both cases are equally entitled to credit, I see no other mode of arriving at a correct determination in the matter than by using our own reason and common sense (if we are conscious of having any) in ascertaining which side of the controversy comes nearest the truth. If I am justified in exercising my reason in choosing my religion, which is intended to cure the diseases of the soul, I consider that I am equally justified in determining for myself what mode among the many different ones is best calculated to cure the diseases of the body. "Prove all things; hold fast to that which is good," I believe to be a better rule of faith and practice than the opposite one—"Believe every thing without examination that you may be told, and always act from the dictation of another's reason and conscience in preference to your own."

In regard to the argument brought from the Bible in which it is alleged that the Deity appointed it to be used in the rites of religion, and also recommended its use for medicinal purposes, I would observe that the wine so used and so recommended was not alcoholic or fermented wine. Pure wine, as it comes from the grape, before any chemical change occurs in it, is a very good article for any one to use, whether sick or in health; but wine that is decomposed, fermented, or, in other words, rotten, becomes a virulent and destructive poison. What is true of wine is true, without exception, of every other article of food. If chemical change occurs in any thing that is appointed for our food, it becomes in consequence not only unfit for the support of life, but is actually calculated to destroy it. The wine appointed by God to be used in his service was not rotten or pernicious wine; so far from this being the case, he utterly forbade the use of any substance that had undergone fermentation to be employed in his service. The wine used by the Jews in the Paschal Supper was unfermented wine, and the wine used at the Paschal Supper was the same as that used by our Saviour in the institution of the Lord's Supper. The Jews of the present day, in obedience to the command of God, put away every fermented substance during the Passover from their houses, and in those services use only unfermented wine. During the seven days of the festival the use of fermented substances was forbidden under pain of death.

To the use of pure unleavened wine, such as God appointed in his service, and such as he recommended for use, I have no objection, but otherwise, for pure wine is a blessing; but fermented or alcoholic wine is a curse, and is so decided in Sacred Writ. There is the same analogy between pure wine and alcoholic wine as there is between beef in its

All the Products of Fermentation Poisonous.

natural state and stinking, putrid carrion; the one is good, and the other, in consequence of fermentation, becomes a nauseous and disgusting poison.

In support of the views I have taken in regard to the use of alcoholic poisons by the sick, I would state that the most celebrated physiologists and physicians of the present day describe these poisons as very destructive to life and health. Liebig, the highest authority of the present age in regard to the laws of life and health, and also a physician, testifies to the destructive effects of Alcohol when taken into the body. Its effects are the conversion of arterial blood into venous, when absorbed into the circulation—the one essential to life, the other destructive of it. Youmans, a celebrated chemist of our own country, has given a mass of evidence from experiments, showing that it affects injuriously every part of the body. Sir Astley Cooper, the most celebrated physician of the age, affirms "that spirits and poisons are synonymous terms." Dr. Carpenter, acknowledged to be the highest authority in Physiology, states that alcoholic liquors are poisonous, affirming "that Alcohol, whenever taken in small quantities, weakened the powers of digestion, particularly among people living in warm climates, and that those who were thus addicted died of diseases which did not generally attack those of different habits."

The testimony of nearly five hundred medical men before the British House of Commons is the same. They certify in that testimony "that ardent spirits is ascertained by medical science to be in a strict sense a poison, and that its use as an article of diet is the direct cause of an appalling amount of disease and death."

The doctrine and practice of using a substance that *causes disease and death*, for the purpose of curing disease and preventing death, is a doctrine that I can not believe.

Again, I should observe, that in my opinion, if not impossible it is utterly impracticable to obtain that desired by the physician in his requisition. "Pure brandy" and "pure" alcoholic "wine" can not be had. Anybody knows, who is the least acquainted with the subject, that in ninety-nine cases out of a hundred the articles so called are adulterations and counterfeits. Drugs and poisons of the worst kind are mingled with other alcoholic liquors, and sold as "pure wine" and "pure brandy." I would call your attention to an extract from an editorial article in the *N. Y. Daily Times* of a recent date, headed "The Wine Humbug," commenting on the well-known and acknowledged fact.

As it is the Alcohol existing in "pure wine" and "pure brandy" that is required for medicinal purposes by the physician, and as Alcohol is

Pure Alcoholic Liquors not Obtainable—Digestibility of Alcohol.

the same in its nature and physiological effects in all the compounds in which it exists, the only rational way of complying with the real requirements of the physician is to furnish him with the pure Alcohol or common whisky, and allow him to manufacture the "pure wine" and "pure brandy" himself for his patients.

Though I consider the use of Alcohol, either as food for the healthy or as a medicine for the sick, as grossly absurd and ridiculous, yet I consider it, in its pure state, less mischievous to either than those villainous compounds of other violent poisons with it that are sold and drank as "pure wine" and "pure brandy." All of which is respectfully submitted.

JOHN P. CUMMING.

But our author has made Alcohol *digestible* because it is burned, consumed—that is, oxydated. By the same reasoning he could make *calomel digestible*, because it is reduced to an oxyd in the duodenum; and so he could make a *brass screw* or a *tenpenny nail* digestible, because it is burned, consumed, oxydated in the system to a greater or less extent; and so the man who swallowed a bar of solid lead did begin to digest—that is, oxydate it in the stomach after a few days; and what must seem very marvelous to our opponent, just as the stomach began to digest the lead, the lead began to poison the stomach!

Our author quotes Liebig again: "Of all respiratory matters, Alcohol acts most rapidly." The truth I think I have shown to be the exact converse of this proposition. The truth may be thus expressed: *Of all poisons, Alcohol is most rapidly acted upon.*

And again he quotes Liebig: "Its use enables us to dispense with starch and sugar in our food," and so we may dispense with sugar and starch much better without the Alcohol than with it.

I hold this whole theory of Liebig, which has misled nearly the whole medical profession, as an egregious error. It is not true that the lungs are a stove or fireplace, in which or from which the body is warmed by the combustion of carbon or hydro-carbonaceous materials. Heat is evolved by all the

Alcohol a Substitute for Other Food Controverted.

chemico-vital changes which are always taking place everywhere throughout the organic domain, in the perpetual formations and disintegrations of tissue; and the oxydation, or combustion, or burning of the waste or effete materials is not for the purpose of supporting heat, but for the purpose of eliminating them from the system.

If the combustion of carbon in the system is intended, in the economy or organic life, to be a warning instead of a depurating operation, then those compounds of hydrogen and carbon, which are the most combustible of materials, ought to be among the very best respiratory foods, as ether and olefiant gas, both better hydro-carbon combustibles than Alcohol; and if Alcohol is better respiratory food than sugar or starch, then ether and olefiant gas should be better respiratory food than Alcohol. But somehow or other it happens that all the chemists and physiologists regard them as "essentially poisonous." No one has ever suspected them of being food, and thus we see that the Westminster Review again defeats its own position by proving too much.

ALCOHOL AS A SUBSTITUTE FOR OTHER FOODS.

But the strong point with our author is, after all, the use of Alcohol as a substitute for other kinds of food. He tells us that Alcohol saves the transformations of tissue; saves the consumption of fat; supplies even the place of the proteinaceous or nitrogenized foods. "If you don't drink Alcohol you must supply its place with some bread and pudding." "Teetotalers make up in pudding what they lack in wine," etc.

If Alcohol really does these wonderful things our author has above ascribed to it, it does precisely what ought not to be done. The tissues *ought* to be transformed, and the fat ought to be consumed, and that without hindrance from any poisonous intruder, for on the integrity of such changes depends the health of the organism.

Whatever may have been the motives of our author in in-

Evils Resulting from Intemperate Eating.

troducing this phase of the argument, whether he intended it as a "serious joke" or a magnificent farce, I am sincerely grateful for the opportunity it affords and the data it furnishes for reading the temperance people, as well as other folks, such a lesson on dietetics as many of them are sadly in need of.

I can easily understand how it is that some societies and individuals are enduring as great if not greater evils from improper and intemperate eating than others are from moderate or immoderate drinking.

If one half the world are sickening and dying, full of infirmities and miseries, as is, alas! too true, because of erroneous habits of eating, it does not make Alcohol any better or worse. If they paralyze their morbid appetites for food by means of Alcohol, and so endure the use of the *essential* poison better and longer than they could the *abuse* of food, it only shows a choice of evils. It proves no absolute good in the Alcohol.

I think this consideration will enable us to explain the fact that "hard drinkers scarcely take any food, and yet manage to live through many years," much better than the hypothesis that the Alcohol nourishes and sustains them. "Cornaro lived on twelve ounces of solid food a day, *and a little wine*." If he had not wasted any of his vitality in getting the wine out again he might have lived several years longer on even less food.

In rare cases drunkards have lived to seventy or eighty years of age, and in several well-authenticated instances excessive users of tobacco have lived as long; and in both cases there have been learned men so oblivious of common sense as to attribute their length of days to the sustaining influences of the liquor and tobacco.

I hold this to be a correct rule of judgment in all cases: whenever premises are laid down which, followed out to their legitimate results, contradict common sense, and are opposed

Hydropathy Misrepresented—Fat ought to be Consumed.

to what we *know* to be true, the premises are themselves false.

Our author's allusion to hydropathy does its advocates great injustice, for it states the exact opposite of the truth. "The teetotalers and hydropathists are especially inconsequent, for they declaim against Alcohol because it is a stimulant, and are eloquent on the virtues of tea and coffee, which are also stimulants."

The truth is this: hydropathists do not declaim against Alcohol because it is a stimulant, but because it is a *poison*; and they are not eloquent on the virtues of tea and coffee, but they condemn them for the same reason—they are *poisons* also. This is proved by the fact that hydropathists do not, at least generally, have them on their tables.

But Alcohol saves the consumption of fat. So much the worse. The fat *ought to be consumed*. Arsenic, also, as we have seen in the case of the Styrians, saved the consumption of fat. Feed a dog on butter, starch, or sugar alone, and you will save in him the consumption of fat. But the dog will die of starvation. He will be plump, round, *embonpoint*, and yet die of inanition. So, too, a great deal of beer with very little food will make a man round, smooth, bulky, gross. His fat will be saved when it ought to be destroyed. He will be, in proportion to his fatness, a bloated mass of effete and adipose accumulation, but he will not be healthier nor stronger; nay, he will be sicklier and weaker. Not only this, but his blood will be impure, inflammatory, and putrescent, and ever liable to run into mortification and gangrene from very slight wounds or injuries, as all hospital surgeons testify.

Recollect, after the battles of Alma and Inkerman, the English surgeons were astonished at the tenacity of life of the Russian soldiers. Their frightful wounds healed with extraordinary facility, and they refused to die from the most fearful injuries. Their diet was plain, coarse, simple, and moderate in quantity. Beef-and-plum-pudding-eating and beer-drinking

The True Object of Food—The True Purpose of Life.

Englishmen were killed by injuries much less severe, and their wounds healed with greater difficulty, comparatively.

Our author seems to have mistaken entirely the "chief end of man." He seems to imagine that the great end and aim of existence is to eat to beget force, and beget force to enable us to eat—the joys of existence, of course, to be comprehended in the idea of tickling the palate and provoking the "spirit of play." Can we not see something better, higher, above and beyond all this?

The object of food is to supply tissue ; the object of tissue is to supply force ; the use of force is to connect us in active, sensible, and sensatorial relations with all the world of matter and of mind, with man and angels, with God and nature, with the universe.

The Creator has most beneficently made the highest happiness we are capable of enjoying, the highest intellectuality we are capable of attaining, and the highest moral development we can aspire to, consistent with and dependent on our adaptation to and conformity with all the laws of our being.

"Intensive pleasure can never be extensive." He has constituted us to enjoy moderate yet constant pleasures in all our organic relations. But when we resort to wine and other intoxicating beverages to "make the heart glad," we find in the end that great truth of revelation and of reason, "Wine is a mocker, and strong drink is raging ; he that is deceived thereby is not wise"—a truth which the errors of Liebig, the blunders of Pereira, the admissions of Carpenter, nor all the false doctrines of all the schools of medicine can never, never overthrow, however much they may obscure its light and prevent its recognition for a time.

Has man no purpose on earth except to gratify his morbid alimentiveness at the expense of all his moral and intellectual nature ? Are the "pleasant emotions," the "brilliant saws," the "sportive feelings," the "charms of society," the "empire of clairvoyance" over the "rigidity of reason," the

Qualitative and Quantitative Effects of Alcohol.

“spiritual chimeras” of an intoxicated brain over “utilitarian enterprises,” to compensate us for the fearful havoc of dram-drinking usages, and the terrible wreck of body and soul in every place where alcoholic beverages are among the fashions and follies of the people ?

CONCLUSION.

I believe I have now replied to all the positions of the Westminster Review which are material to the main issues between us. But the same arguments are stated and the same ideas advanced in so many ways and such various verbiage, and, withal, so connected with collateral data, that I propose to devote a few pages to a notice of the most prominent and important “points” they present.

We have but to apply the principles I have all along endeavored to establish, to each and all of our author’s positions against teetotalism, to see their fallacy at a glance.

Says he : “Life-giving oxygen is as terrible a poison as strychnine if given in excess.” “Excess of mutton is fatal.” “Light produces blindness in excess.” “The maladies induced by our study make a list scarcely less alarming than those induced by intemperance.”

How vain, how delusive are all these flourishes of rhetoric and deductions of logic, so long as they are based on false premises ! Oxygen, light, and mutton chops are *natural* elements, products in the growth and formation of organic matter. Alcohol is not. The former, therefore, *may* be useful or nutritious, and they *may* be used or abused. If abused, they do not become poisonous, but injurious. With Alcohol, all use is abuse.

“The difference between quantitative and qualitative effects must be kept steadily in mind. Two mutton chops are means of nutrition ; five, of indigestion ; seven, of utter prostration. One glass of brandy-and-water [why the ‘*and-water?*’] creates exhilaration ; three glasses, perplexed thinking, with a tendency to tears ; five, a picture we need not paint.”

Liquor-Drinking and Lying Twin Vices.

Does not our author much better illustrate the principles I have laid down than his own? He shows most clearly that the effects of mutton and Alcohol are totally unlike either in small or large quantities. One in excess *injures*; the other *poisons* in all quantities. Two mutton chops do—what? They are means of nutrition. One glass of brandy-and-water *exhilarates*! Why is it not alleged to be also “a means of nutrition?” Our author is too astute to pretend that exhilaration has any analogy with nutrition; nor will he pretend that such respiratory food as sugar, starch, or oils can in any form or quantity produce any effect analogous to exhilaration.

Then, again, a large dose of mutton chops (seven in number) produces “utter prostration.” Well, here is an over-dose of mutton-chop food. Now give an over-dose of the other food, the alcoholic (five glasses), and see if it produces “utter prostration” also. Oh, no. It is “a picture we need not paint!” I think our author’s facts prove the converse of his own proposition. They prove to a demonstration that “difference of degree” does *not* become appreciable in “difference in kind.”

Our author admits that “if Alcohol can be called intrinsically a poison, the temperance advocates have as much right to regard moderation in drinking to be only moderation in vice, as we have to regard moderate lying to be a minor form of mendacity.”

“I thank thee, Jew,” for that admission. I have called Alcohol, and I think proved it “intrinsically a poison;” and now I call on the Westminster Review to proclaim to the English people, as I shall to the American, that liquor drinking and lying, whether practiced moderately or immoderately, are twin-vices, and I hope the Review will not fail to republish the following sentence, substituting the word *liquor* for “lying:”

“Lying is a vice, a vice qualitative, and there is not much difference, morally, between a man who lies liberally, with

All Food Tissue-Forming—Respiratory Food a Fallacy.

large indulgence, and a man who is constantly but minutely mendacious."

Liquor-drinking is a vice qualitative ; and I can not see for the life of me any difference, morally, between a man who gets drunk liberally "on a large indulgence" and a man who is constantly but minutely tippling.

I have already intimated that I deny, as utterly unphilosophical and fallacious, Liebig's theory of respiratory food. The distinction I have already made between aliment and poison proves all food to be tissue-forming. Even our author admits that Liebig's views are adopted as much from convenience of classification as from any opinion of their truthfulness. He says :

" Since Liebig's ideas have been circulated, it has become an established rule to class food into two distinct kinds, *plastic* or *tissue-making*, and *respiratory* or *heat-making*." " Even those who do not altogether adopt Liebig's views on this point, admit the classification as *convenient* for ordinary purposes."

And our author has himself in the very next sentence admitted, or rather affirmed, the fallacy of the respiratory-food doctrine, for he says :

" But to use chemical language, *all* food is burned in the organism," an admission fatal to any proposition he has assumed in his whole argument relating to respiratory food.

In alluding to the comparison of the organism to a steam-engine, our author notices one imperfection, and says, by way of correction, " the organism consumes its own tissue, and the fuel which never becomes tissue." He would be nearer the truth if he should say, the consumption of its tissue *is* its fuel. And if he should say *force*, instead of fuel, he would be quite correct. He would in this way harmonize his own discrepancies, and show that *all* food is converted into tissue, and all *force* is derived from the consumption of tissue ; and hence his chemical problem, that " *all* food is burned in the organism," would be correct if transposed as follows : all

Doctrine of the Digestibility of Alcohol Exploded.

food is converted into tissue, and *all tissue* is burned in the organism.

In this view of the case there is no difficulty in understanding how *force* comes from the disintegration of tissue; nor in understanding how this force may be needlessly wasted by filling the system full of what have been absurdly called "respiratory materials," while the force thus engendered has to be expended in getting rid of.

The following quotation is a remarkable, if not a "curious curiosity :" "Lohman cautions us, in estimating the nutritive value of an aliment, not to be guided solely by its elementary composition, but also by its digestibility, which thus becomes one factor in the sum. Now the *digestibility* of Alcohol, so to speak (why 'so to speak ?'), surpasses that of any other aliment; it requires less elaboration to fit it for its ultimate purpose, namely, the translation into nervous force."

Is our author, indeed, experimenting with human credulity or gullibility ? Is he perpetrating a stupendous hoax ? Is he amusing himself, like a shrewd and cunning lawyer, in trying to make "the worse appear the better reason ?" or is he candidly and honestly self-stultified ?

Alcohol is the most digestible thing in the world, and most easily translated into nervous force ! If we want nervous force, then, easily and without much trouble of elaboration, we can find it in ten thousand grog-shops, at three cents a drink. What is nervous force ? Is it brain, mind, sensation, feeling, thought, or nerve-substance ? He does not tell us, neither can he without explaining the joke—if he is joking.

Digestibility of Alcohol ! Alcohol, when decomposed, is resolved into vinegar; and the first stage of the process of digestion, supposing what is not supposable, that the system should undertake to digest it, would spoil it as a respiratory food forever. Its combustibility would be ruined utterly, and so far from being "heat-forming," it would be *refrigerating*. Vinegar, as every body knows, is *cooling*. Does not the

The Subject considered Chemically—Moleschott.

Westminster Review man know that people make vinegar, especially in the pickling establishments, out of Alcohol? Does he not know that wines and cider are very liable to run into the acetous fermentation—become sour?

Let us examine the chemistry of this matter a little closer. Alcohol is composed of carbon, oxygen, and hydrogen. It is a poison to the system, and when taken into the system the "nervous force" must and does exert and expend itself to get rid of it. How does it do this? By combining oxygen with the carbon of the Alcohol, producing carbonic acid, and leaving the oxygen and hydrogen to form water or to enter into other chemical combinations. In this way it is decomposed and got rid of, and this process of oxydation, by which it is burned up as a heretic, and its ashes (carbonic acid gas) ejected as effete matter, our author calls digestion! He might as well say, if he had caught a thief in his apartment, and cut him into mince-meat, and then threw the fragments out of the window, that he had digested him.

Moleschott is also quoted by our author. Moleschott "points out that the wine saves the tissues from being burned, by *offering itself as fuel.*" Wonderfully clever and considerate wine! More humane, too, humanly speaking, than many who sell thee and drink thee! Lest our tissues should undergo disintegration, should be changed for new, and do just what nature intended to have them do, the wine *offers itself a sacrifice* that the tissue may be saved. Magnanimous mediator! It offers to stand or suffer, to interpose between the requirements of the organism and the means nature has provided to answer those requirements. Benevolent wine! Thou intendest well, no doubt, but thou art evidently mistaken.

A certain place (which shall be nameless, but which much wine is said to bring vividly and *warmly* to the imagination) is said to be paved with good intentions. But wine, in this its propitiatory offering, is probably as ignorant of the uses

The Westminster Review is Ridiculous—Organic Chemistry.

of tissue as are its admirers and advocates. We are bound, of course, to feel greatly obliged to the wine for its unselfish devotion to the good of others, but we can not avail ourselves of its generous *spirit* of martyrdom, lest we should be victimized as well as it. If we consented to take undue advantage of its marvelous kindness, and burn it as fuel, we should only waste our own strength in so doing. The sufferings of the wine would not be our gain; nay, we should suffer (justly, I think), because we made it suffer. The wine might be annihilated (as a form of alcoholic beverage), but we should get "nothing, yea, less than nothing." We should incur the loss of some portion of our force-material, which ought to have been expended in some better way than in consuming poor, innocent, self-sacrificing things, which would never do us any harm in the world if we would only let them alone.

"King Alcohol 's a tyrant dire;
His reign is like consuming fire,"

has been the language of the temperance songster. But did he not do his majesty great injustice? Should not his song have been

Blessed wine 's a tissue-forming food;
It burns (is burned) like any wood?

Our author continues his amusing ratiocinations:

"The point in debate is not whether Alcohol can be converted into nervous *tissue* (which may or may not [more may *not* than *may* probably] be the case), but whether it can be converted into nervous *force*. Organic chemistry *may* one day show that Alcohol is actually converted into nerve-tissue, which already one may suspect to be the case from its great affinity and the selective eagerness with which it acts on that tissue."

Organic chemistry *may*, perchance, discover something in the distant hereafter to help my opponent along with his argument, but organic chemistry is clearly against him so far. I

Selective Affinity of Alcohol for Nerve-Tissue.

respectfully suggest that he wait for his data until organic chemistry discovers them, and not *anticipate* so much.

But we have the ludicrous announcement that Alcohol "selects" the nerve-tissue to act upon. Intelligent Alcohol ! How didst thou *know* that nerve-tissue was "good feed" for thee, or pleasant to act upon ? Just now, in the whirling mazes of our author's logic, thy brother, wine, was willing to be *burned up* to save the tissues—even to save the fat, which is no tissue at all. But thou, forsooth, art disposed to *eat up* the tissue, even that which is called nervous. Cruel, wicked, treacherous Alcohol ! Wine is a gentleman still, though no scholar. But thou, though a scholar, art no gentleman. Verily thou art a ravenous cormorant. Thou art "eager" to devour that part of us, the nerve-tissue, which more especially raises us above the brutes that perish, by its greater predominance in us than in them, and which, we have flattered ourselves, more immediately allies us with the angels and the spirits (not ardent, vinous, nor malt) above us. Perverse, malignant, nerve-devouring demon ! what did the great poet call thee—even he, the bard of Avon—William Shakespeare ? "O, thou invisible spirit of wine [he meant Alcohol], if thou hast no name to be known by, let us call thee—*devil*." Thou art clearly "the evil one." Shakspeare could penetrate almost as profoundly into the nerve-tissue as thou canst, and no doubt he saw thee there exercising thy "selective affinity," and named thee accordingly.

In contrasting beer with bread, our author remarks : " Let any one for a moment consider the absurdity of a proposition which says that a pinch of meal has greater sustaining power than a quart of beer ! Let a man be hungry or weary, with scanty food, and a large amount of labor to get through, and then let him try how much assistance he would receive from a pinch of meal. What assistance he gets from beer is known. It is no answer to this to say the force is temporary. All force is temporary."

Nutrition of Force a Mere Vagary.

But it is answer to this to say that he gets *no force* from the beer at all. The "nutrition of force" is a mere vagary of imagination. The beer elicits, draws out force *from* the system, just as a lash would from a jaded horse. When a man is fatigued, nature's remedy is rest. You may then stimulate him or whip him, and he will manifest his wonted, or, perhaps, unwonted energy. But the stimulant has not *given* him any strength, nor has the whip; it was not in either of them to give; and it is a law of common sense, if not of universal philosophy, that a thing can never impart what it can never possess.

Our author has compared the saving of tissue by the combustion of Alcohol to the saving of coal in a furnace by the use of oil. If the vital machinery was in any sense like a furnace, and if the object of the organism was the evolution of heat, there would be what there is not now, some analogy in the cases. Heat is not force in a steam-engine, nor in an air-gun. It is a producing cause of steam or rarefied air, and these are forces. In the vital organism no such forces are necessary nor possible. Force, then, is contraction of muscular fiber, and that alone. Our author can not point to a single act, motion, charge, or manifestation of force that does not imply this muscular contractility. But he says:

"If Alcohol prevents a certain quantity of effete matter from being burned and carried away, it also prevents a certain quantity of living tissue from becoming effete so that *the balance is preserved.*"

This "*balance*" is the quietude of torpor or death. The effete matters can not be retained without themselves becoming sources of waste and causes of disease; nor can the living tissue be prevented from becoming effete without just to that extent destroying its vitality. Men who reason in this way have not certainly any very definite notions of physiology or pathology, health or disease, food or poison. If one wishes to save the tissue completely, so that the "*balance*"

Chemical Speculations in Relation to Vital Machinery Ridiculous.

will be preserved forever, he has only to extinguish its vitality and then condense it by the application of such antiseptics as tannin and Alcohol.

"While so much tissue is saved, an equivalent amount of force has been generated by the Alcohol," says the Review; and again: "When Alcohol is burned, the tissue remains just where it was before;" and yet again: "Thus do we explain why intemperate drinkers can subsist on a modicum of food; they burn Alcohol instead of burning their bodies."

Why, then, might not "intemperate drinkers" use all liquor and no other food, and so save all the tissue and burn nothing but Alcohol, and so live forever? Our author has now invested Alcohol with a great affinity for oxygen, and like its brother, wine, it is now willing to be sacrificed to propitiate the voracious gas. This *would* be kind, if oxygen has no other purpose to serve in the animal economy except to devour something. It does seem to me that these chemical speculations in relation to the vital machinery, in utter disregard of physiological laws, are supremely ridiculous.

But what has all at once become of the eager selective affinity of Alcohol for nerve-tissue? Has our author already forgotten about that? A few moments ago he had his Alcohol *acting on the nerve-tissue*; now it is *yielding itself to oxygen*. He has made his dashing Proteus perform a very sudden and most wonderful somerset, and from one of the most active agents possible, become one of the most passive imaginable. Our author evidently intends to be on the right side in the end. He takes all kinds of positions on all kinds of questions, so that whatever organic chemistry may hereafter determine to be true, he can point back to his former labors and say, "Such was my doctrine exactly."

But on the next page our author either forgets himself again, or he is preparing more "loop-holes of retreat" against future discoveries.

Various Inconsistencies of the Westminster Review.

He says, "Life is only possible under incessant stimulus. Organic processes depend on incessant change."

How now, man! Scarce a moment ago we were to have the "balance maintained" by preventing the effete matter from being consumed, and by preventing the tissues from becoming effete. Life was to have been kept going by just the combustion of Alcohol, and nothing else. But now, *presto* back again, "organic processes depend on incessant change." The balance, the cessation of the transformation of tissues is death after all!

But this change is dependent on stimuli, and our author thinks Alcohol in stimulating the organic changes ought not to be specially reprobated, because other things do the same. What next are we to have in the name of nonsense unparalleled! We have Alcohol already performing so many functional offices in the animal economy, and in so many diverse and contradictory ways, that we are puzzled to recollect them all. It has saved the tissue, offered itself in sacrifice, prevented transformation, acted on the nerves, yielded to oxygen, etc., and now it turns up a stimulant to produce the identical changes it was a little while ago so useful to prevent.

The Indian replied, when reproved for taking too much whisky, "Too much just enough;" and our author seems to imagine that his logic grows stronger as he multiplies the ways in which Alcohol operates in serving us. One would almost imagine he was under the Indian's *experience* while writing his "double and twisted" argument in favor of the innumerable ways in which Alcohol is a food, as well as diverse other things.

Our author admits that, after all, there is something peculiar about Alcohol which justifies its bad reputation. And he asks, "What is this peculiarity?" and then answers, "Nothing less than the fascination of its virtue, the potency of its effect!"

Shade of Bacon, and of all sober men, what meaneth this?

Nonsense of the Westminster Review Ridiculed.

But more of the same sort, and worse than all, is to come: "Were it less alluring, it would not lure to excess; were it less potent, it would not leap into such flames of fiery exaltation. In its virtue lies its crime!"

"*Ne plus ultra*," said a learned pedagogue to his illiterate neighbor who could not comprehend a word of Latin; but not wishing to be outdone in a show of learning, the latter replied with the only classical quotation he had any knowledge of, and that was, "*Vox populi*." This interesting discourse was just as near a disquisition on metaphysics as these last quotations from our author are to an argument or a reason.

If the crime of a thing lies in its virtue, it is certainly dangerous to have a virtuous thing, or to be virtuous ourselves. Such arrant foolishness can not be replied to seriously. It is fit only for derision and ridicule.

If any meaning or sense is to be extracted from our author's very peculiar logic, it is this: The peculiarity of Alcohol consists in its being Alcohol. If it was less alluring, it would not lure so much. If it was less potent, it would not be so powerful. If it was not Alcohol, it might be something else. Now, seriously, Alcohol has neither virtue nor criminality, but *our virtue* consists in abstaining from it, and *our criminality* lies in using it. The "potency of its effect" consists in the repugnance of the vital machinery to its contact; and "the fascination of its virtue" is found in the depravity of the organic instinct which has lost its peculiar and natural sensibility by long association and constant warfare with it.

I need not follow the author, nor weary the reader with his quotations from Johnston and other authors who assume that "fermented liquors exercise a healthful influence," who call "wine, the milk of the aged," and who think a little "schnapps" and beef-steak just as good, if not a better dinner than beef and bread. They involve no principle not already fully answered.

The whole argument of the Westminster Review is based

Its Whole Argument based on False Premises.

on false premises, and is replete with inconsistencies and contradictions. Yet it is the ablest scientific argument I have ever read in favor of alcoholic diet or alcoholic drink, and as such is entitled to respectful attention. I trust I have given the careful reader the true grounds upon which to explain and understand, not only the nature and effects of Alcohol, but of all other poisons; and if these truths can be applied to the habits and lives of the earth's inhabitants, this beautiful planet may be transformed from a Pandemonium to a Paradise.